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THE RHODE ISLAND MEDICAL SOCIETY
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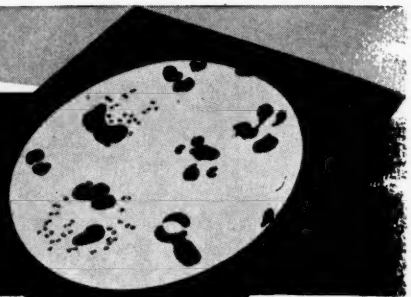
In the Rapid Eradication of GONORRHEA



THOUGH the sulfonamides presented a signal advancement in the treatment of gonorrhea, many published reports indicate that penicillin is the therapeutic agent of choice for three potent reasons. First, *efficacy:* penicillin proves effective in virtually all instances. Second, *safety:* penicillin is practically nontoxic. Third, *brevity of treatment:* in the majority of cases, definite cure can be effected in 24 to 48 hours.

Studies at an Army Station Hospital showed that most sulfonamide-resistant gonococci are fully susceptible to penicillin; that penicillin resistance is difficult to establish.

Frisch, A. W.; Behr, B.; Edwards, R. B., and Edwards, M. W., Am. J. Syph., Gonor., & Ven. Dis. 28:527 (Sept.) 1944.

From a study of 109 patients, the conclusion is drawn that penicillin effectively eradicates chemoresistant gonorrhea in the female.

Greenblatt, R. B., and Street, A. R., J. A. M. A. 126:161 (Sept. 16) 1944.

At a U. S. Naval Hospital, 200 cases of sulfonamide-resistant gonorrhea treated with penicillin, showed no toxic reactions; all returned to duty in one-third of the time previously required.

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"In the Technical Bulletin of Medicine, No. 26, recently issued by the War Department, penicillin is stated to be the drug choice in the treatment of gonorrhea."

J. A. M. A. 126:575 (Oct. 28) 1944.

191 consecutive cases of sulfonamide-resistant gonorrhea responded dramatically to penicillin.

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No toxic effects were observed in a series of sulfonamide-resistant gonorrhea of the female treated with penicillin. As compared to hyperpyrexia, penicillin treatment "is incomparably easier, simpler, safer, cheaper, and just as effective."

Barringer, E. D.; Strauss, H., and Horowitz, E. A., N. Y. State J. Med. 45:52 (Jan. 1) 1944.

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For therapy in the physician's office and in the patient's home, the Combination Package of Penicillin-C.S.C. deserves the physician's preference. It provides two rubber-stoppered, aluminum-sealed, serum-type, 20 cc.-size vials, one containing 100,000 Oxford Units of Penicillin-C.S.C., the other 20 cc. of sterile, pyrogen-free physiologic salt solution. Penicillin-C.S.C. is of high purity, as indicated by the small amount of substance required to present 100,000 Oxford Units.

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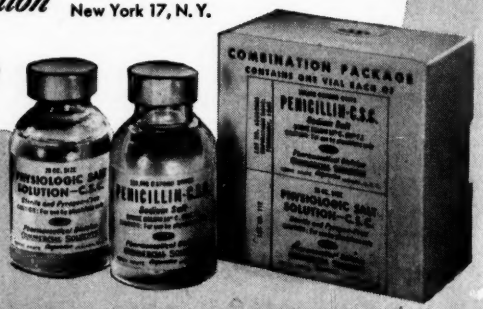

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The RHODE ISLAND MEDICAL JOURNAL

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THE SURGERY OF THE VEINS OF THE LEGS: VARICOSITY AND SOME PROBLEMS IN THROMBOSIS*

JOHN HOMANS, M.D.

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IT is clear today that shortcuts in the treatment of varicosity, by which I allude particularly to the injection of varicose veins, are being supplanted by a return to older methods recently considered too radical. There has, in fact, been a cycle which began with Trendelenberg's division of the saphenous vein in the mid-thigh, which went on to very elaborate complete dissections (attended by a varying mortality from pulmonary embolism) to which there came a reaction in the form of treatment by injection alone. Following this "pure injection" phase, thorough obliteration of the root of the saphenous vein at the groin became established as a basic procedure with which various sorts of injection might be associated. Now there has been a further return toward radical surgery in the form of measures supporting high interruption of the saphenous vein, some of which involve stripping out the varicose veins of the thigh while others include merely a supplementary division in the region of the knee. A limited use of injection still clings on but is being regarded as of less and less importance. With this brief sketch in mind, I will try to tell you what seems to me to be the most satisfactory way of dealing with varicose veins, so that one may, if I may use a slang phrase, "get the most for one's money." In preparing you for this plan of campaign, I will set forth my own conception of the nature of varicose veins and the physiology of the circulation in the legs when varicose veins are present.

1. Venous blood passes up-hill against gravity not by any magic but because it is pushed up through valved vessels by muscular tension and effort, and only obtains the help of suction from above when it comes within the range of the heart's action. There may or may not be a valve in the common femoral, in the region of the inguinal ligament, above the point where the great saphenous enters. Thus, the valves of the upper saphenous may, and often do, bear the full weight of the column of blood above. Hence the frequency of saphenous varicosity.

2. A varicose vein is nothing more than a superficial vein, almost necessarily the great saphenous, which, having lost its valves, is unable to transmit blood against gravity. Such a vein accumulates blood which it shunts into the very much more abundant and well protected deep veins within the muscular aponeurosis. The connecting, or perforating veins, are so arranged that the blood can escape very readily from the superficial into the deep system, and, obviously, these useful connections are much more abundant and important below the knee than they are above. On the perfection of this escape mechanism depends the freedom of the varicose leg from undue congestion.

3. In connection with varicosity, one ought to consider venous pressures. It is true, as Adams has pointed out, that pressures in the veins of the legs represent the height of a column of blood between the level observed and the heart. It makes no difference, from this point of view, whether or not valves are present, but observe this: in case the varicose individual strains or coughs, pressure in his varicose superficial veins rises to great heights—to arterial heights in fact—whereas straining or coughing adds nothing to the pressure in the well-valved vein. It is necessary that surgery should do away with these excessive pressures by cutting off the varicose veins from all valveless connections above them.

4. Going on with this idea of pressures, the treatment of the superficial varicose veins need not consider particularly the state of the deep veins, a matter contrary to general belief. For inasmuch as the high pressure and congestion in varicose veins always add to the load on the deep system,

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*Presented at the 134th Annual Meeting of the Rhode Island Medical Society, at Providence, on May 17, 1945.

any procedure which decreases that load must be helpful. Even if the main femoral system is not fully competent, in which case the foot will perhaps show some cyanosis, cutting off varicose pressures must help and not harm it. Bear in mind that if the deep veins were not successfully raising blood against gravity, the varicose leg would be deep blue or black, a state making the standing position impossible. Thus, some degree of venous engorgement need never forbid the interruption of varicose veins—rather encourages it indeed—and a pink foot associated with varicosity guarantees a remarkably satisfactory deep circulation. You will see that this conception belittles the value of some of the elaborate tests intended to bring out the state of the deep veins in the presence of varices.

Based on all these considerations, one should, in planning an operative procedure, begin with the idea of obliterating the saphenous vein at its junction with the femoral. One should back up this indispensible high section of the varicose saphenous by dissecting out its various local branches in the groin as well as all branches of the femoral below the inguinal ligament, in order to prevent the reformation of *any* connections between the remaining varicose veins of the thigh with the valveless pelvic veins above. After this, the procedures used are a little like those of the pessimist who wears both suspenders and a belt. One plans to get rid of conceivably overlooked incompetent deep communications of the varicose veins of the lower thigh and the region of the knee. The perforating veins in this region have been held to be abundant and Sherman has recently made an accurate study of them. I myself do not take them very seriously, but if one proposes to interrupt them, one may introduce the Mayo stripper or similar device from the incision in the groin downwards along the saphenous vein, tearing off branches as they are met or, better, cutting down on the stripper wherever it is stopped by an entering vein. One may also inject downwards into the lower stump of the saphenous vein a sclerosing solution, or one may, as Sherman suggests, combine dissection and injection. In any case, it is very good practice to pick up, through a transverse incision, either just above or below the knee—having worked out the exact position of all the varicose veins beforehand —the principal trunks of the saphenous system, so that no further accidental pressures can be transmitted to the remaining varicose vessels of the lower leg. Actually this low division should precede, at the same sitting, of course, the dissection at the groin.

Beyond this, one hardly need go, but if one chooses, one can treat any unsightly veins remaining in the lower leg by local injection, and I must say that this is about the only legitimate use for the injection of sclerosing solutions below the knee. Sherman, of whose observations on the course and connections of the saphenous vein in the thigh I have just spoken, recommends that the varicose veins of the calf be treated by injection before the operation on the groin and thigh is undertaken. I myself, if I feel obliged to deal with these veins at all, prefer to make local injections after the more important part of the operation has been accomplished, but in any case, I would warn you against any schemes for injecting downwards from the operative field in the groin a sclerosing solution by way of a catheter passed backwards into the veins of the lower leg or perhaps against merely allowing the flow of the solution into these lower veins without interruption in the region of the knee. My reason for this statement is that the one accident which the surgeon should have in mind is secondary thrombosis in the deep veins of the lower leg. It is from this source that dangerous quiet thrombosis (phlebothrombosis) and pulmonary embolism arise. In my opinion, where free injections are used, there is much more tendency to this sort of thrombosis in the lower leg than in the thigh, for there, as you will already have noted, the connection between the superficial and deep systems is rather indirect, and solutions introduced into the saphenous in the thigh are unlikely to reach the femoral system in any important concentration. Whereas, in the lower leg, they may reach the deep veins in a very concentrated form, and so cause thrombosis of a serious kind.

I spoke a little earlier of "getting the most for your money" in an operation for varicose veins. By this I mean breaking all varicose pathways to the valveless veins of the pelvis with the least trouble, expense and danger to the patient. I believe that the so-called "low-high" division, unaccompanied by any stripping, is in this sense the most desirable method. The operation can always be performed under local anesthesia—the infiltration for the lower incision being made first, so that the anesthesia in the higher field will become established while the low dissection is going on. If the incisions are carefully made and closed, the patient may get out of bed on the evening of the operation, or perhaps better, the next day, and can begin to exercise the leg increasingly from that time on.

If the stripping operation is carried out in combination with the high division, as is now so often recommended, one must, as a rule, use some sort of general anesthetic, perhaps an intravenous one only, and necessarily inflict a little more trauma, in the broad sense, that when a local anesthetic only is given. However, there is no question that in connection with the careful high dissection, a stripping operation offers a better guarantee of freedom from recurrence than anything else I know.

Post-phlebitic Femoral and Saphenous Varicosity

I would now call your attention to another sort of varicosity involving the femoral as well as the great saphenous vein. This sort follows thrombosis, especially femoro-iliac thrombophlebitis, "milk-leg" or whatever you choose to name it. Years ago, Edwards called attention to the destruction of the essential valves of the veins by thrombosis within them. Yet a thrombosed vein rarely remains obstructed, but rather is canalized, becoming a useless fibrosed tube, transmitting high pressures from above and being incapable of forwarding blood against gravity. Both the femoral and saphenous vein may be left in this state. Under such conditions, a collateral circulation, often a very effective one, becomes established. This circulation, which must carry the entire venous load, does its work better when the useless femoral and saphenous veins are interrupted than when they are transmitting high back-pressures and probably an actual back-flow of venous blood. All this sounds radical, even heretical, but my own experiences support my contention. Coller and his associates at Ann Arbor have recently taken up this subject.

The evidence for femoral varicosity, if I may so describe it, is found first of all in the history. Consistent with this, the affected leg will be a little more blue than the other on dependency, has a little more than the normal liability to swelling, some enlargement of the superficial system of veins, and, perhaps, a tendency, at least, to ulceration. I should like to go into the ulcer problem with you in more detail, particularly the hypersensitiveness of the more or less edematous and fibrosed tissues to substances absorbed from the feet, but I shall have to leave that out.

In exploring the veins at the groin, one can readily recognize an old diseased saphenous vein, but it is perhaps not generally known that one can also recognize, much more easily than is generally supposed, a formerly thrombosed femoral vein. The femoral vein and artery will be unnaturally adherent to one another and will be surrounded by a good deal of scar tissue. When palpated between the finger and thumb, the vein will feel distinctly thickened and show none of the typical external evidence of a valve, in the form of a waist-like narrowing and whitening just below the point at which the deep and superficial femoral veins join. Finally, if one has determined that the femoral vein has been diseased, one can open it between stay sutures and see for himself the asymmetrical thickening and evidence of canalization which is almost necessarily left by the old phlebitic process. I have sectioned a previously thrombosed femoral vein, now on some half dozen occasions, dividing not only the femoral, above or below the profunda, but the varicose saphenous vein as well. Following the operation, the patient's leg improves so greatly in color on standing and walking that the change is at once noticeable to him, and he is aware, as well, of a greater lightness and ease of motion in the use of the limb. I commend this important and rather new field of surgery to your attention.

Quiet Thrombosis (Phlebothrombosis): Pulmonary Embolism

These processes are known to be very much more common than was believed possible even ten years ago, and the medical profession is now less apt than formerly to regard pulmonary embolism as an unavoidable accident or act of God. There are three points of view which I should like to commend to your attention. First, a more or less quiet, often unnoticed, thrombosis may occur in the deep veins below the knee of any individual, at any age, occasionally during active life and frequently as a result of confinement to bed. More often than not, some minor or major injury initiates this state, and it is still more common in patients who have been operated upon or who suffer from serious illnesses of a variety of sorts. Second, this quiet, non-obstructing process, the external evidence of which depends greatly upon its extent and whether or not the individual is reclining in bed, usually precedes the familiar inflammatory femoro-iliac thrombosis, antedating the obstructive stage for what may be a considerable period. The not uncommon development of the quiet "phlebothrombosis" into the inflammatory thrombophlebitis has been observed particularly by Swedish investigators, notably Bauer. Third, one must look upon many of the deep, quiet thromboses as terminal processes occurring, as Hunter, Sneeden, Robertson and Snyder have very definitely brought out by their careful dissection of the veins of the legs in a large series of autopsies, in a percentage which varies from perhaps 40 to 50, increasing more or less directly with the depressed state of the patient before death.

With these conceptions in mind, one must be on the look-out for the early and dangerous stage of phlebothrombosis under a variety of circumstances. I speak of the early dangerous stage by contrast with the more outspoken obstructive stage because, during the latter, the likelihood of embolism is practically over, yet one can often obtain a history of pulmonary infarction during the days or weeks preceding the out-spoken swelling of a limb. It will perhaps, therefore, be worthwhile to summarize rather briefly the evidences of the quiet, early disease. The most conclusive evidence is that pulmonary embolism has taken place. Into this diagnosis I need not go, except to say that often it imitates cardiac or pulmonary disorders, as Dr. Paul D. White first indicated, and that one may

continued on next page

need to make use of roentgenological studies and the electrocardiogram. Of greatest importance, in a patient under continuous observation, or already confined to bed, is an otherwise unexplained rise of temperature, and of the pulse and respiratory rate. The chart will often show that this has preceded the actual embolism. And if no outspoken embolism has as yet occurred, it should be regarded as a warning. It probably represents small preclinical infarctions.

Once pulmonary embolism is suspected, one must search the lower limbs for signs of the local process, recognizing that a very limited thrombosis may give rise to a long, soft, dangerous propagating clot. At an early stage, then, there will probably be no swelling of the ankle or cyanosis on standing. There may, however, be some slight pain or discomfort in the back of the calf, the popliteal space or even the foot. Particularly, there may be present some slight enlargement of the calf, detectable only by frequent routine measurements. Moreover, any thrombosis may cause some muscular irritability, so that the calf muscles feel a little resistant to the grasp. If stretched by forced dorsiflexion of the foot, they may resist a little, giving the patient a sense of tightness back of the leg, and causing him, perhaps, to flex the knee a little—the dorsiflexion sign.

One must visualize this early stage as being represented by thrombosis in one or more of the deep venous systems in the lower leg. I have already explained that there may or may not at this time be a propagating, non-obstructive, floating thrombus in the femoral vein, but signs of femoral obstruction will surely be absent.

Later, when the advance of the process has partly filled the femoral vein, the ankle will, perhaps, show a little edema and the foot a little cyanosis on standing, but in bed no such aids to diagnosis can be expected.

When the femoral vein is well filled with a good deal more thrombus, yet not completely obstructed, and the disease extends, perhaps, up into the iliac vessels, there will then almost necessarily be some degree of permanent edema and cyanosis, even when the patient lies supine in bed. These signs will be still more marked if the patient reclines, the legs relaxed, since this position favors venous stasis. One must recognize, in such an advanced stage, that though one leg is seemingly the only one involved, there is a strong probability of a less noticeable thrombosis in the opposite leg.

Indeed, bilaterality of thrombosis in the veins of the lower limbs is far more common than is usually supposed. Only when the process is clearly due to some local injury or perhaps to the immobilization of a limb in a plaster cast or other apparatus, is there a strong probability that thrombosis is confined to one leg. I, myself, in treating early cases, try to recognize the conditions which I think indicate uni-lateral disease. But I am rarely fully confident, and at a later stage, I never dare to be certain of this point.

The treatment of the conditions which I have so briefly outlined, and which I have pictured, diagrammatically, in a recent publication, have by no means become standardized. My own reaction has always been toward attempting to ligate or section the involved vein at a point proximal to the process. However, I recognize that the use of anticoagulants, if intelligently carried out, may sometimes be a better means of dealing with the tendency to thrombosis and of preventing pulmonary embolism. Perhaps I can give you an idea of today's trend in treatment by sketching for you conditions in which one method or another seems to me superior. Let it be understood, in considering any treatment, that the younger, more active and healthier individual is far less likely to suffer from the complication of pulmonary embolism than is the older person, especially if the latter has been committed to bed by accident or illness. One dreads embolism particularly in individuals over fifty.

Division of the femoral vein at the groin seems to me to be suitable for early cases, in which thrombosis is recognized as being present in one leg and in which there is good ground for believing that there is a local cause for such a process. If, for example, a young man or young woman has suffered an injury to the foot, or perhaps a minor tear of some muscle below the knee, and has developed swelling of the ankle with local signs in the calf muscles, I should not hesitate to advise exploration and section of the femoral vein below the point at which it joins the deep veins of the thigh to become the common femoral. An operation of this sort has a finality which can be secured in no other way. One should not expect to find thrombosis at the level of ligation. In older individuals, in whom there is an excuse for thrombosis in one leg, this same holds true, but when embolism has occurred in such persons and there is an obvious possibility of a bilateral process, it is far better to section both femorals than to be content with operating only on the leg chiefly under suspicion. Again in the presence of embolism, when the signs in the legs are equivocal and when it seems undesirable to subject the patient to a general anesthesia or a more radical procedure, exploration of both femoral veins seems to me the procedure of choice. In such a case and in the older processes, the common, rather than the lower (superficial) femoral should be interrupted.

Even if the above proposals seem reasonable, one must be prepared to find at operation unex-

pected, non-obstructive thrombosis in the upper femoral, and, in that case, one must extract the thrombus by suction with a smooth glass tube, emptying the vessels above the level of the opening and ligating the common femoral at the conclusion of the procedure. This is not a very satisfactory operation, for one is left with the feeling that further thrombosis and embolism may occur. I shall return to this in a moment in speaking of the use of anticoagulants.

Higher division of the veins, that is, of a common iliac or even the lower vena cava is now being used when the source of embolism cannot be determined and when the process is presumably bilateral and has reached a fairly high level. It should be recognized that the high divisions, that is, of the common iliac or lower vena cava, cause *less disturbance* of the future venous circulation in the leg than division of the common femoral. This rather surprising finding is related to the nature of the collateral circulation, for the higher division offers an opportunity for the escape of blood through pelvic vessels by way of the hypogastric vein as well as by the various veins of the abdominal wall; whereas division of the common femoral, when the main femoral and many of the deep veins of the thigh are more or less obstructed, often results in a very seriously swollen leg. The accumulation of blood in such a leg may indeed be so serious and so rapid as to cause shock, and deaths have occurred as a result of operations of this sort.

Anticoagulants are probably going to prove more and more valuable as an exact evaluation of their action becomes better and better known. Indeed, in many parts of this country, surgery is very little used and anticoagulants are almost the sole reliance. The chief objection to them is that they give no final assurance that during their administration embolism may not occur, or that after their withdrawal, thrombosis and embolism may not take place. This is not to say that a good deal of reliance may not be placed on the prevention of further embolism while the drugs are being given. I do not believe, myself, that one need dread softening of a propagating thrombus and detachment as a *result* of their administration.

The drugs in principal use at present are dicoumarol and heparin. The former, which is inexpensive and can be given by mouth, acts by decreasing prothrombin formation by the liver and lengthens the coagulation time in proportion to the lowered percentage of prothrombin in the blood. The drug takes more than twenty-four hours to establish its effect and the blood must be studied at regular intervals. Actually the percentage of prothrombin must be reduced to 30 percent of the normal, but it must not be reduced much below this point. Heparin, an expensive preparation, usually given intravenously, but available for intramuscular injection, may be introduced during the preliminary period during which dicoumarol is preparing to act. It need not be continued thereafter. I would rather not go into the dosage and details of the use of these drugs since good accounts are appearing and the final preferred scheme for their use is perhaps not yet available, but I have already given you some idea of the plan which may be pursued.

The cases most suitable for the administration of these anticoagulants are presumably those which occur postoperatively, as a result of childbirth and as a complication of confinement to bed because of serious "medical" illness. Probably the prophylactic use of dicoumarol will prove to be more important than the administration of the drug after thrombosis and embolism have taken place, but even this is by no means certain. If I were pinned down to the indications, I should say that anticoagulants will most likely be preferred when the source of thrombosis is not altogether clear, when, under such conditions, embolism is threatened or has already occurred, and especially, when a clean-cut surgical cutting off of the source of embolism seems contraindicated or seems unlikely to be successful. Beyond this, I do not dare to go and you should recognize that I, myself, have surgical leanings which make me a prejudiced witness.

In regard to the two subjects I have taken up, I should like to leave you with the impression that the first, varicosity of the veins of the legs, is being more intelligently and somewhat more radically treated than was the case some ten years ago. Early ambulation is considered absolutely essential to the prevention of secondary thrombosis and embolism. The varicose veins must be cut off as permanently as possible from pressure from above. It may be advisable, but is not necessary, to remove them in the thigh. There is a very significant lightening of the load on the deep veins when varicose veins are sectioned; and the femoral system itself may properly, in post-phlebitic states, be interrupted.

Thrombosis of the deep veins is recognized as a common phenomenon, occurring under a great variety of conditions. The form giving rise to embolism is deep and quiet. The outspoken form—thrombophlebitis—is usually a late stage of the quiet process, now called phlebothrombosis. Surgical and non-surgical means of halting thrombosis and forestalling, or putting a stop to, embolism are indicated and the next few years should see an intelligent standardization of the available methods of treatment.

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INTERNAL DERANGEMENTS OF THE KNEE-JOINT*

The X-ray Diagnosis

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THE number of patients with chronic derangements of the knee-joint has always been large and the number of such patients is bound to increase with the return of war veterans to civil life. Failure to make a correct differential diagnosis, which requires a good history, a careful physical examination and a complete x-ray study including demonstration of the menisci, is the principal reason for the inadequate treatment received by so many of these patients. The utmost in diagnostic help can be obtained from the x-ray examination only if the interpretation of the findings is made with full knowledge of the clinical picture. This demands attention to the smallest details for it is often only by these details that a satisfactory diagnosis can be made.

Internal Derangement

Patients suffering from injuries of the semilunar cartilages usually give a history of a sudden rotary movement of the knee either carried out by the patient or brought about by some external agency such as a fall or a blow upon the knee. Veterans may give a history of having been blown up or buried by an explosion or of falling into a ditch or trench. Not all derangements are caused by injury. A knee subjected to repeated synovial effusions from any cause may suffer loosening of its cartilages due to progressive stretching of the capsule and ligaments; and then the loosened cartilage may be caught momentarily between the joint surfaces.

Locking is the most dramatic complaint in derangements of the knee-joint, even though it is not always prominent in the history. More important than locking is the symptom of unlocking, being more characteristic of a replaced torn or loosened cartilage. Locking may be due only to stiffness caused by effusion, muscular spasm and pain.

Acute injury to the semilunar cartilages is usually associated with synovial effusion and when this subsides, pain and tenderness persists over the situation of the injured cartilage. Since effusion, pain and tenderness can be due to sprain of the tibial collateral ligament, a definite diagnosis sometimes must be based on the behaviour of the cases subsequent to the original symptoms. In such cases, the characteristic symptom of locking may be late in appearance.

In the roentgenograph, the soft structures which can be demonstrated in the knee-joint are the skin, the subcutaneous layer with its large veins, the rectus femoris, the vasti, the suprapatellar space, the patellar ligament, the infrapatellar fat pad and its extensions, the gastrocnemius and hamstring tendons, the adductor muscle and its tendon, the cartilage lining of the joint, the tibial collateral ligament, the extra-capsular bursae when distended, and finally, the menisci.

The internal meniscus may be demonstrated simply by traction or abduction of the leg. This can be done by placing the patient in the recumbent position on his side, with a sand bag between the table and the lateral aspect of the knee to be examined. A horizontal x-ray beam is directed anteroposteriorly through the knee while the leg is held in abduction against the table top. The exposure is

FIGURE 1: The internal meniscus as demonstrated in a normal knee by abduction of the leg.

*Presented at the 134th Annual Meeting of the Rhode Island Medical Society, at Providence, on May 17, 1945.

made two or three seconds after the initiation of abduction because if made earlier or later, the full vacuum is not created by the traction or abduction of the knee. A lateral view of the meniscus can be obtained as easily as the AP view, using the same technical principles, but usually no additional information is derived. It has been found that more than 5-10 cc of fluid, when present in the knee-joint, will prevent demonstration of the meniscus by this vacuum technique. It is only non-visualization of the meniscus, therefore, which carries diagnostic weight because acute injuries of the meniscus are usually associated with excess synovial fluid which makes demonstration of the meniscus impossible. It has been found that the meniscus cannot be demonstrated in 20% of normal knees. If the meniscus in the injured knee cannot be demonstrated while the meniscus in the healthy knee can be demonstrated, these findings are taken to indicate the presence of excess synovial fluid in the injured knee, and this finding can be relied upon even though there is no clinical evidence of swelling. If the meniscus in either knee cannot be demonstrated, then these findings have no value, since this finding is present in 20% of normal cases.

In an uncomplicated injury to a meniscus, swelling of the synovia with excess synovial fluid, swelling of the tibial collateral ligament and inability to demonstrate the internal meniscus by the vacuum technic may be the only x-ray findings in support of the clinical diagnosis; but it is the absence of other x-ray evidence of disease which may be of even greater importance to the clinician in the differential diagnosis of these cases. The first condition to be considered in the differential diagnosis is loose bodies.

FIGURE 2: Internal Derangement Knee-joint. An acutely injured knee which locked in a football accident. Swelling of the synovia, and of the tissues in the region of the upper portion of the tibial collateral ligament and failure to demonstrate the internal meniscus by the vacuum technic in the x-ray examination are the usual findings with a tear or rupture of the internal semilunar cartilage.

Loose Bodies

The clinical diagnosis of loose bodies is based on the history of sudden attacks of severe pain, often followed by swelling or momentary locking, due to the body becoming suddenly nipped either between the articular surfaces or between the capsule and joint ends. The momentary locking may be associated with the presence of external swelling, and the patient may make this observation and find it necessary to push the body inwards to free the joint. Large bodies may give rise to less acute symptoms if they are unable to engage themselves between the articular surfaces. Those bodies which remain firmly attached to the synovia or in pockets of the articular surface without getting pinched between the articular edges, seldom if ever cause symptoms.

The x-ray demonstration of loose bodies in AP and lateral views of the knee is not easy, even when they are calcified or ossified. The longitudinal view of the patella, oblique and lateral views in extension and flexion in over-exposed films often are necessary to furnish all the available x-ray evidence in the detection of loose bodies. Thickening of the synovia due to diffuse hyperplasia can be seen by careful attention to the soft tissue shadows, and this furnishes a clue to the presence of chondromata which might be felt but which cannot be seen in the films. Other visible loose bodies, derived by trauma from the articular cartilage, may be suspected after finding defects in the cartilagi-

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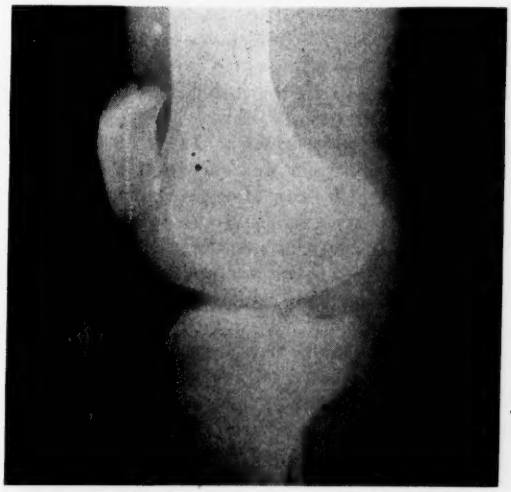

FIGURE 3: Osteo-chondromatous synovitis. A small calcified loose body is present in the suprapatellar pouch, the synovia is thick and fibrous, but no excess fluid is present — note meniscus which is demonstrated by the vacuum technic, not possible in the presence of excess synovial fluid.

nous outline of the femoral condyles and the patella, especially in the longitudinal view. The meniscus examination alone usually rules out the presence of an injury or a loose body and so, these two conditions, which mimic each other so often, may be differentiated. Having excluded the presence of a ruptured meniscus and having demonstrated the presence of a loose body, the x-ray examination alone can be responsible for an accurate differential diagnosis in this large group of derangements of the knee-joint caused by loose bodies.

Sprain or Rupture of the Tibial Collateral Ligament

If excessive rotation of the femur occurs, especially during flexion when excessive abduction of the leg is more readily produced, tears of the ligaments are more apt to occur, which often takes place in conjunction with injuries or rupture of the menisci. Sprain or rupture of the tibial collateral ligament causes pain and tenderness on the inner side of the joint over the attachments of the ligament. The short posterior or oblique portion of the ligament is likely to be sprained when there has been injury to the internal meniscus. If signs of an injured internal cartilage fail to develop, a ruptured tibial collateral ligament may be diagnosed by the persistence of swelling, pain and tenderness on the inner aspect of the knee. Recurrences are not infrequent when the original injury has been inadequately treated. A minor twist or turn is sufficient to bring on a recurrence, causing a sudden "giving way" of the joint followed by swelling, and a chronic condition may then supervene with the evolution of a chronic arthritis. Additional symptoms may become evident, such as increasing abduction of the leg and thickening of the tibial collateral ligament due to fibrosis or ossifying periostitis. In severe injuries, there may be an avulsion of the periosteum where the ligament is attached to the bone. This occurs more frequently from the femoral than from the tibial attachment and when this condition heals, it resembles Pelligrini's-Stieda disease.

The roentgen findings in the acute phases of injury to the tibial collateral ligament include visualization of soft tissue swelling around the knee, more marked on the inner aspect. Synovitis usually is present with ligamentous injuries and the slight increased synovial fluid which is present precludes demonstration of the meniscus. Definite swelling or thickening of the injured portion of the tibial collateral ligament can be demonstrated more easily by comparison with the opposite knee in the x-ray films. This is best seen in the AP and oblique views. In the chronic phase of sprain or rupture, fibrous thickening of the ligament may be visualized, sometimes with adjacent fibrosis in the perifocal overlying subcutaneous tissues.

FIGURE 4: Tangential view of patella in normal knee to demonstrate the inner alar fat pad and cartilage of the femoral condyles.

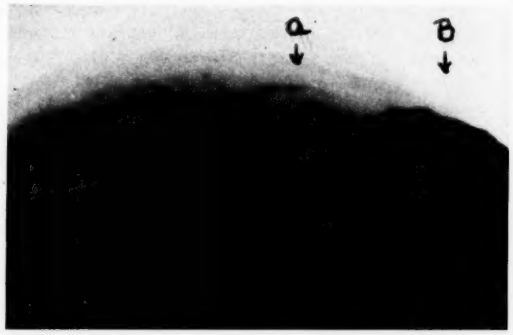

FIGURE 5: Inflammatory hypertrophy of the inner alar fat pad. Note thickening and fibrous infiltration of inner alar fat pad (a) medial to the patella, (b) This condition frequently is confused with internal derangement of the knee.

Rarely is ossifying periostitis present in the region of the ligamentous insertions.

Peri-Articular Bursitis

The many bursae about the knee are not demonstrable normally by roentgen examination, but they may be seen when they fill with fluid as the result of bursitis. Slight swelling of the suprapatellar bursa and the synovia with which it is continuous, is easily detected roentgenographically. This bursa is quite distensible and it can contain a surprisingly large amount of fluid. The prepatella bursa is readily visualized when it contains only minimal amounts of fluid. The clinician is sometimes unable to exclude a co-existing synovitis in the presence of a pre-patellar bursitis, but by the use of the technic to demonstrate the meniscus and by examination of the supra-patellar bursa and the patellar fat pad, the roentgenologist can easily furnish the correct information. Swelling of the pretibial bursa, not infrequently found with Osgood-Schlatter's disease, is nicely delimited by roentgen examination. Cysts of the posterior bursae or synovial

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A DISCUSSION OF THE CAUSES OF CANCER*

STANLEY P. REIMANN, M.D.

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I FIRST express appreciation of the privilege of addressing the Rhode Island Medical Society. I find, as you can well imagine, that the title "A Discussion of the Causes of Cancer" puts responsibility on my judgment as to topics to be discussed and methods of presentation. The word "causes" allows of many interpretations which may be inserted into most any phase of the cancer problem. Thus, we may consider the general "causes" of cancer and express ourselves in descriptive terms. Or we may use chemical and physical terms, or physiological or clinical language depending on the point of view. If we depart from the general to the particular, many different items may, with justice, be classified as "causes". Thus, it is possible to discuss the "causes" of the origin of cancer; the "causes" which make cancer such a universal disease in the animal and plant kingdoms. We may discuss the "causes" of the spread of cancer, the "causes" of the high mortality from cancer, why many more human cases can be "cured" than are at present. The developments of present day methods of treatment by surgery and irradiation have "causes". There are many more, but it is sufficiently clear that most anything that is known about cancer can somehow or other be related to a "cause". Here is where judgment is indicated and I ask permission to wander around a bit. My opinions, when expressed, will be compounded from personal experience and the fortunate situation of having the help and advice of many individuals and groups, to whom I express appreciation. In this presentation the word "cancer" means any malignant tumor.

An immediate "cause" in cancer is "Why are we so interested in it and why are we gathered this afternoon to examine some of its phases?" Approximately 165,000 people in the United States will die of cancer in 1945, or one every 3.2 minutes. The mortality from cancer has been increasing steadily during recent decades. In 1900 it was eighth or ninth among the leading causes of death. In 1940 it was well to the fore in second place. First place in the list of deaths is occupied by diseases of the circulatory system which, as we know, are composed of many different pathological anatomical findings and a host of etiological factors. It is, therefore, probably no exaggeration to say that the greatest single cause of death is cancer. The conceptions of the word "single" are debatable. Obviously cancer of the lower lip is different in many respects from cancer of the stomach. Nevertheless it is possible to find least common denominators in all cancers, largely depending upon the point of view, whether clinical, experimental, genetic, chemical, or others.

As the death rate from cancer rose, there was debate between statisticians of life insurance companies and of official agencies as to whether it was a real or an apparent increase. Today it is fairly well agreed that even after the effect of the increasing proportion of older age groups in the population is compensated, the death rate has shown an increase during the last forty years. For the past two or three years there have been indications that the rate of increase is slowing down. Apparently this is not due to a decrease in the number of potential cases but rather to the relative decrease in the rates of population increase in later years. Other factors, no doubt, have contributed to the increased recording of cancer deaths. For instance, diagnostic facilities and acumen have been increased and thus, perhaps, many deaths now attributed to cancer would have been otherwise classified in the earlier years. I say "perhaps" because such figures are futile. How can we know what would have happened twenty, thirty and forty years ago if the diagnostic acumen had been as good as we flatter ourselves into thinking it is today? If it gives us any pleasure and satisfaction to project ourselves back into the past and speculate on what might have happened had we been as smart then as we are today, it appears just as legitimate to guess what the figures would be today if we were as smart as we ought to be, let alone what might be recorded in the future. For this remark, I

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allude, among other factors, to methods of diagnosis.

An important set of "causes" is the one, theoretical or otherwise, on which is based procedures for the diagnosis of the disease. The number of tests proposed for cancer no doubt runs into the hundreds but not one of them has proved as accurate in differential diagnosis as a thorough history and physical examination, which have their own errors—the earlier the cancer the larger the margin of error in diagnosis. There remains, outside of obvious spread and metastases, as the only method of settling the diagnosis, the microscopic picture. A properly chosen bit of tissue fixed immediately, carefully stained and examined by a competent pathologist should be diagnosable with a margin of error of less than 3%, an error certainly small considering the complications involved.

If pathological examination is the court of final appeal in diagnosis, it is interesting to note that the percentage of reported cases of cancer with the diagnosis confirmed by microscopic examination of the primary site and region is about 65% according to Dorn's studies.

I, personally, rejoice when I see patients with a little granularity of their cervices, or a tiny lump in their breasts hard to find, or a tiny fissure in their lower lips. Then when they ask "Is it Cancer?" I can truthfully tell them that I do not know, but that a biopsy is necessary to settle the case. The objection that performing a biopsy tends to spread a tumor has been disposed of by a number of studies both in human beings and in mice. But the biopsy must be performed with delicacy of technic and proper choice of instruments and methods for the various sites. Certainly there is much less danger of spread from a properly performed biopsy than from rough handling and squeezing of tumors in an attempt at physical examination of them. I strongly recommend light palpation and not massage in diagnosis. I shudder at the practice I have seen in certain tumor clinics of having the attending physicians forming in lines like a parade to squeeze a lump in the breast.

The diagnosis of cancer in the majority of cases is made on the topographical microscopical anatomy and not on cellular details. It brings to mind the famous adage of Professor Warthin that "A good pathologist requires a low power lens and a high power brain." Exceptions to this are found in certain individuals who have been particularly schooled in cellular diagnosis of material from particular places. Thus Papanicolaus, Meigs and others with much experience are able to make the diagnosis of carcinoma of the uterus from properly prepared smears. I would urge, however, that this method be used as a diagnostic criterion only when considerable experience has been acquired with both normal and pathological states.

But to begin more general considerations. It is a fact that various causes may operate to produce cancer in any and all parts of the human body and from all sorts of tissue. It is also a fact that cancer is frequently found in lower animals even though systematic searches for it in these animals are rare. Tumors occur in mammals, birds, amphibians, reptiles, fish and in various invertebrates, until we are almost justified in stating that they may arise in any multicellular organism. Mottram even asserts that carcinogens produce changes in unicellular organisms (Paramecia) leading to behavior and morphology comparable to that of cancer cells. In the case of plants the debate is not whether uncontrolled proliferation and improper differentiation of cells occur but whether or not to call them tumors—malignant or otherwise. Many interesting facts have been discovered in the study of plant growths, some of them highly suggestive. I should like to discuss them further but can only refer you to the work, for instance, of A. J. Riker of Wisconsin and Philip White of the Rockefeller Institute in Princeton for their results, as well as their reviews of the literature.

It is a fact, therefore, that the possibility of development of cancer is a potency of all organisms and all tissues. Herein are many opportunities for finding the least common denominators characterizing cancer wherever it may be found.

The broad biological question can be posed in this fashion; how is it that normal cells grow into definite patterns and how do the patterns come to be disturbed when malignancy appears? Immediately we plunge into some of the profoundest questions concerning living things and their activities. That there is ORDER in developmental patterns has been recognized from time immemorial and pondering on this ORDER has led many of the great biologists of all times to become philosophers. But philosophy fell into disrepute, especially during the nineteenth century. The reasons are not far to seek, for the mixing of metaphysics and science in the hands of many who style themselves philosophers results only in confusion and at times downright nonsense. Philosophy can, however, be used as a powerful intellectual tool for the construction of syntheses if handled for this purpose and for the added one of constructing theories and hypotheses upon which experiments can be conducted. For those who still have a horror of philosophy and shudder at its name, I recommend, among others, Whitehead and his "Science and the Modern World", and Pareto's "The Mind and Society". By no means neglect Lawrence J. Henderson's "The Fitness of the Environment". To those who do experiments on a hit or miss method, and many such are performed, these and other books will supply leaven to the dough. The cancer problem particularly needs snythesis, for there is

hardly a subdivision of science from which information does not come. Cancer, baldly stated, integrates into the problems of growth and development and synthesis is necessary for intellectual integration. Whether we call it philosophy or not is again a matter of names.

In studying growth and development we may begin at many points, but for convenience the fertilized ovum may be chosen. Fertilization is not necessary for the development of competent organisms, for all ova, in which the experimental difficulties have been conquered, have been found able to develop without aid of spermatozoa. Fatherless rabbits are well known and the human ovum itself has divided at least once parthenogenetically in the laboratory. Spermatozoa, also, from several species have developed in eggs from which the female nucleus has been removed. The experimental conditions under which this takes place are more difficult to achieve than in the case of ova but the androgenetic frog is well known. This is of interest in the theory of the development of certain tumors, such as teratomas and dermoids, which, hypothetically at least, may have their origin in parthenogenetically developed ova or spermatozoa (Bosaeus). Other similar tumors may come from the unfortunate ones of twins, triplets, quadruplets and perhaps even quintuplets.

The processes by which a fertilized ovum develops into a new and competent individual are many and varied. For our purposes we may concentrate on three; (1) multiplication, which occurs by way of mitosis, the general morphologic details of which are similar in all species of animals and plants; (2) the second process we may call differentiation, defining this term by stating that it is a series of changes whereby cells become more specific from more general, wherein they come to take on different compositions in tune with the functions which they perform in the development and maintenance of the organism; (3) the third process we may call organization and it is especially this term which must be defined carefully. For our purposes let us say that organization is that series of processes whereby cells of different differentiations gather themselves together in the right numbers, at the right times and the right places to produce organs and parts which function within the frame of a new individual with the characteristics of the lineage from which the original fertilized ovum came. You will note that I say "within the frame" of an individual. This concept—frame of an individual—is best treated in a philosophical way, specifically by the so-called "organismal" theory. The cell theory in its classical form is no longer a generalization but describes a special case. There are numerous competent organisms with nuclei but no cell walls, for instance, the siphonaceous algae. If we think of protoplasm as continuous within an organism, then its division into cells is one of its characteristics. It is better to speak of the activity of protoplasm than the activity of cells in many cases. As deBarry put it "the plant (animal) builds cells and not cells the plant (animal)." Certain tumors are composed of nucleated masses of protoplasm, i. e., syncytiae.

From this point of view an examination of cancer shows that its cells multiply but not within the frame of an organism, i. e., they do not organize at all in the sense in which this word has been used. Furthermore there is something wrong with the way cancer cells differentiate, not that they do not reach high degrees of specialization, for many times they do, but there is always something wrong and they are not under the control of the organism as a whole. "Cancer is an escape from the individuation field." (Needham)

A few detailed remarks upon proliferation, differentiation and organization are now in order. It has been shown clearly that they are anatomically, genetically, chemically and physically interdependent, but they are, nevertheless, separable phenomena.

In the anatomical details of cell division an enormous amount of work has failed to reveal differences characteristic for cancer. The multi-polar mitoses and various kinds of distortions which have been found are present also in growths other than cancer.

Multiplication per se is not a cause of differentiation in normal cells for differentiation takes place in many instances without multiplication. Therefore we should hesitate to attach the blame for the improper differentiation of cancer cells on multiplication. Cancer is not a disease of cell multiplication—unless future evidence decides otherwise.

While multiplication, differentiation and organization, as stated, are independent and serve different functions, nevertheless, there are interrelations. Cells cannot differentiate unless they are in existence and they appear by multiplication. They cannot organize unless and until they have differentiated. The relationship may be expressed this way:

Cells multiply

Cells differentiate after they have multiplied

Cells organize after they have multiplied and differentiated

By substituting a few words the following results:

Cells multiply

Cells differentiate because they have multiplied

Cells organize because they have multiplied and differentiated

or it can be stated in this way:

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Cells multiply in order to differentiate
Cells differentiate in order to organize
or
Cells differentiate and organize because they have multiplied

This semantic legerdemain, as you notice, has brought out numerous important philosophical considerations classified as hormism, vitalism, "elan vitale", fate, Greek tragedy, freedom of the will and other products of the activity of the human cerebrum. But we cannot tarry over them.

Mathematical, chemical and physical equations, as a rule are reversible. It is at least interesting to see what happens if we try to transpose our language equations, so to speak. In transposing from one side to another of our language equation we follow the rule of changing signs. What happens?

The statement becomes—cells multiply because they do not differentiate and organize.

You will recognize this immediately as the long sought "cause" of cancer. Cancer cells continue to multiply because they do not differentiate properly and do not organize at all! Attention is centered forcefully on the organization problem.

Perhaps you do not approve of what I have called "semantic legerdemain", but it is analogous to the use of ordinary mathematics—nothing more comes out of juggling figures than is put in, but oftimes by rearrangement, mathematical statements are put into more intelligible, more useful and more investigatable form. That this is also a justifiable method of the use of words instead of mathematical symbols is amply evidenced by recent studies in what is called "symbolic logic" as exemplified, for instance, in J. H. Woodger's "The Axiomatic Method in Biology". There is no time for further discussion of this most interesting recent development of a very old subject except to say that its use in expert hands tells us what we know and what perhaps is more important, what we do not know, and that in unmistakable terms. Perhaps I had better justify a few of the legerdemain statements before proceeding further.

A main point is that differentiation is antagonistic to multiplication. Every text book of biology bristles with facts supporting this statement. Actually there is even a chemical reason why cells which pass a certain stage of differentiation can no longer divide. In passing from the undifferentiated to the differentiated state there is chemical reconstitution, and the complicated chemical dynamics necessary to mitosis cannot take place after the differentiating chemical changes have occurred.

You will note in the multiplication-differentiation antagonism our old friend "histological tumor grading". The place this occupies today is a minimal one and as I had occasion to emphasize years ago, it should play no part in clinical tumor practice.

One more elaboration in regard to differentiation. It is a determined fact that within undifferentiated tissues there are more chemical compounds with reactive polar groups than in differentiated tissue. Many compounds are of such nature that different syntheses can be effected, for instance, of the amino acids. Now if a cell passes from the undifferentiated to the differentiated state and turns into, let us say, muscle, it acquires definite chemical moieties—in this case myoprotein. Which it did depended upon the environment, broadly speaking, in which it found itself. In biological terms, the potency of a cell is greater than its developmental fate. It can do more than it does. Which of its various possibilities it picks out depends upon its environment. There is a point at which it is determined what path of differentiation a cell shall take. As it proceeds there is no turning back and after certain degrees of differentiation have been reached de-differentiation of a single cell is no longer possible.

If we translate these remarks we find that cancer cannot arise from cells which have reached a certain degree of differentiation. Therefore all cancers must arise from division-capable cells—hence incompletely differentiated. If the cells from which cancer arises are incompletely differentiated then their developmental possibilities should be greater than their developmental fate. Experience shows that they are, for various parts of many tumors show different anatomical pictures indicative of different degrees and kinds of differentiation. Hence the standard methods in most text books, and in most teaching, of explaining the origin of tumors, have an element of incorrectness as based on present day biological knowledge. As a concrete example we should not say that a squamous cell carcinoma arises from squamous cells for squamous cells have differentiated beyond the point where they can divide. The proper method of statement is: the spinous-cell or squamous-cell carcinoma arose from incompletely differentiated cells, that is, from basal cells. They differentiated to look like squamous cells but are never quite identical with the normal. Disturbance of the differentiation processes, not in degree but in kind, is one of the characteristics of malignancy.

ORGANIZATION: Normal development is epigenetic and not pre-formed, that is, one part in developing brings to bear its influence on the parts succeeding. Only a few of the influences which guide organismal growth can be mentioned and fewer still will be picked to examine their relation to cancer. Among them are genetic factors, hormones, growth centers, gradients. It is repeated that cancers do not organize at all in the sense in which the word "organization" was defined. That cancers influence normal tissues to grow with them is evident from the growth of stroma in them. The

cancer stimulates stroma if only to provide nutrition, but the cancer in its turn is not influenced by organizing influences as is normal tissue. Cancer is a disease of organization.

HORMONES: Insofar as their effect on growth and development is concerned hormones have been evolved to guide differential growth. They add nothing and subtract nothing from the potencies inherent in cells. They play upon them, now allowing them to expand, now contracting them. The surge of activity of the gonads both before and during puberty allows the cells of certain organs to express more of the potency present in them, leading to a change in the differential contour of the body. As a pathological example the large head, hands and feet of acromegaly may be mentioned, or the benign tumor or cysts of the breast with granulosa cell tumors of the ovary.

Direct experiments on the malignancy problem with hormones have been done in great numbers. The sex hormones, for example, produce a series of changes classified as metaplasia. Squamous cells replace the cylindrical cells lining the prostate glands. Squamous cells replace the lining of the uterus. Male mice develop breasts as large as those of their sisters. Whether or not the injection of hormones directly "causes" cancer depends upon the definition of the word "cause". They certainly increase the incidence of cancer of the breast in mice—but, may I say, only in strains predisposed to the development of the disease? All in all, perhaps we may generalize by stating that of and by themselves hormones do not directly produce cancer. This statement will be debated but it can be resolved into the following analogous situation. Of a hundred traditional Irishmen, all smoking short-stemmed clay pipes, several will probably develop cancer of the lower lip. Why not all? Something in addition to the hot clay pipe stem is needed and apparently this is true of the hormones. If it is postulated that the "something else" is constitutional, then it may well come under the heading of genetics.

The extremely practical question of whether the use of female sex hormones in women predisposes to the development of cancer is unanswerable at present. The amount of hormones given clinically is usually less than that given experimentally to mice. We cannot as yet pre-determine by any methods which of a strain of animals or human beings is susceptible to cancer. Hormones cause cellular activity in the breast or uterus of a woman; hence there is more statistical change of cells undergoing malignant change when a thousand are active than when only ten are active. At present it would appear advisable to make physical examinations of breasts and uteri at frequent intervals in women given female sex hormones.

Another question—what influence do hormones have on cancer already established?—has a better answer. They have no direct effect on cancer cell multiplication as far as present evidence indicates. Castration of males for relief of carcinoma of the prostate and its metastases acts by way of the differentiation of the cells of the tumor and not of cell division.

On the other hand certain cancers produce hormones—thus testicular tumors, adrenal tumors, thyroid tumors, pituitary tumors and others. The background biological process comes under the heading of "chemical differentiation of cells" by which is meant that many cells build tiny laboratories within themselves which produce highly specific and characteristic substances. In the so-called hormone-producing tumors, the products of their intracellular laboratories manifest themselves by changes in the sex organs, in the psyche, in differential growth, in intermittent hypertension and various other phenomena. So characteristic are the symptoms that the presence of such tumors can be diagnosed at times over the telephone!

GENETICS: Cancer as such is, of course, not hereditary. It is the predisposition to the development of the disease that has been shown to have a genetic background.

Theoretically we may classify the genetic phase of the problem into three groups.

1. We have stressed that the practical difference between cancer cells and normal cells is loss of the ability to organize of the former and their inability to differentiate normally. These two characteristics I call "practical" because they are the basis of diagnostic procedures. Since they are transmitted from cell to cell, they have been said to constitute a new race of cells, or that "somatic mutation" has occurred in a normal cell. This brings up the concept of "somatic mutation" as it occurs in all biology. The major enigma is to differentiate changes in the cytoplasm and the nucleus, and to assess the relative proportions of each. There is abundant evidence that chromosomal or genic changes occur in somatic cells. However, quite recent work has shown that self-reproducing bodies in the cytoplasm also may change or mutate and, what is especially significant, under the control of the nucleus. Haddow stresses Sonneborn's work in protozoa and studies of the mutations of plastids in plants. As an example from plant physiology, we mention that self-reproducing bodies in the cytoplasm depend on the nature of the nucleus;—in the so-called Japonica mutant of maize, the white stripes in the leaves are due to a mutation of the plastid which is conditioned by a particular recessive gene in the nucleus. The maize plastid loses one of its capacities to differentiate—in this case to make chlorophyl. We may say, therefore,

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in the case of transformation of a normal to a cancer cell that the concept "somatic mutation" is legitimate, reserving for the future the determination of the relative importance of the nuclear and cytoplasmic constituents in this transformation. In any case it is clear that cytoplasmic mutation is important in cancer for viruses grow in the cytoplasm of preferred cells, the descendants of which are altered.

2. The second problem concerns the genetic constitution under which the predisposition to the development of cancer occurs. It is well known that mice can be so bred that the susceptibility to cancer is increased or decreased. Further facts are that the inheritance of each type of tumor is different and specific. In this intricate situation the development of the specific tissue patterns, for example, of carcinoma of the breast in mice, is similar to other genic effects such as size differences or resistance to disease, in which the conditions are sometimes simple and sometimes extremely complex. The predisposition to cancer in mice is not dominant nor a simple recessive; indeed in certain strains of mice breast tumors are not chromosomal but perhaps cytoplasmic in their inheritance.

In human beings the evidence is by no means so clear cut for reasons which are obvious. Human beings do not mate to please geneticists and most human beings do not know what killed their grandfathers or grandmothers. Human evidence comes partly from so-called cancer families in which a large number of the members develop the disease. A second source of evidence comes from twins in which case monozygotic twins yield a probability of 90% and dizygotic, 30% to 35%. There are many cases in the literature of identical twins who developed, for example, carcinoma of the same breast, in the same position, within a few months of each other. Further evidence is given in the work, particularly, of Madge Macklin which shows how statistically improbable the development of cancer is in many instances unless there is a genetic basis.

It is quite apparent that the theory of "chronic irritation" has occupied not only the center, but almost the entire stage for so long that the hereditary factors have been neglected. This is readily understandable, especially on the part of clinicians, some of whom are ready to accept the theory of "chronic irritation" as an established fact because they have witnessed an occasional tumor developing in the site of chronic irritation. This is not to decry the removal of foci of irritation such as infected cervices, leg ulcers and a host of others but at least the mental reservation should be made that the direct relationship to cancer has no rigid proof as a generalization. This does not exclude "chronic irritation" as a selector of susceptibles but rather puts it in the proper perspective. There are plenty of other reasons for removing foci of infection.

Reluctance to accept an hereditary basis in human beings is understandable also for there is nothing we can do about choosing our grandparents and thus avoiding the susceptibility and there is much that can be done about "chronic irritation".

In generalizing we may say that there is a genetic predisposition to the development of cancer in many strains of human beings, that it is not for cancer in general but for cancer of a specific organ or part. As a recommendation, people who come from cancer families should be examined more frequently perhaps than others. The problem of

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NATIONAL HEALTH INSURANCE — SOME FUNDAMENTAL ISSUES

THE advances in the field of medicine that have taken place, in the past two decades especially, have made the actual application of modern techniques in diagnosis and treatment a matter that is usually both complicated and costly. This has involved an increasing dependence on hospitals and has made necessary the cooperation of specialists and the use of expensive equipment. The public generally is aware of the situation. A demand for hospital and group study and treatment exists and is steadily increasing, partly, perhaps, as a result of the popularity of prepaid insurance plans such as the Blue Cross. It becomes increasingly evident that the medicine of the future must be to a greater and greater extent hospital and group medicine.

Inherent in the concept of the "four freedoms" must be that of freedom from disease as far as it can be accomplished. Granting the advances and achievements of American medicine and its superiority at its best over medicine as practiced elsewhere, we still have the problem of making it available, *at its best,* to all despite its increased cost. This pressing problem, it will be admitted by all, cannot be solved by an adherence to the status quo. At the same time the ill-considered establishment of a system that involves fundamental and radical changes in methods of practice is to be feared.

The following needs are obvious:—

(1) A great increase in the number of hospitals throughout the country.

(2) A system of some sort that will bring the benefits of modern medicine, preventive and curative, within the reach of the person of moderate or low income.

In addition to these desiderata there should be included increased support of medical education and research with especial attention to opportunities for post graduate teaching.

(1) INCREASED HOSPITAL CONSTRUCTION. There appears to be no question in the minds of the physicians of the country as to the desirability of this phase of improvement in medical care. The need is so apparent that throughout the nation various local agencies already are developing plans to this end. It is evident, however, that in many parts of the country local, and even state agencies, will not be able to achieve the results needed, and that to build and staff hospitals enough to serve the population federal aid must be obtained. To this end two bills have been introduced before Congress, The Hill-Burton Bill (S-191) and also

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a new title in the Wagner-Murray-Dingell Bill (S-1050). Both of these "Hospital Construction" Acts will doubtless receive the support of the medical profession generally as to their main objectives and provisions in regard to which there appears to be no real controversy.

(2) PREPAID MEDICAL INSURANCE. As to the second objective, the institution of a new system for enabling the public in general to bear the increased costs of medical care, the new bill introduced by Senators Wagner and Murray in the Senate and Mr. Dingell in the House provides a system of health insurance. This, Senator Wagner believes, will make prepaid medical care available to 135,000,000 persons. It has been discussed in the previous issue of this JOURNAL and in current issues of the Journal of the American Medical Association. Whether or not it is the best that can be devised to accomplish its purpose is a question. Certainly in its revised form it represents an honest effort to correct some of the deficiencies in the previous bill, but essentially the plan is unchanged. In any case it is time for the medical profession to re-evaluate its ideas on the fundamental question involved, which is:—Is pre-paid compulsory health insurance likely to benefit the average American citizen or the reverse? Another question which arises as a corrollary is:—Does a system of compulsory health insurance necessarily involve such a degree of bureaucratic control that freedom of action and choice is taken away from patients and physicians alike so that on the one hand the patient has no feeling of an intimate relationship and trust between himself and the doctor of his choice and on the other hand the physician finds his work "cut and dried", and the incentive to progress and to improve his skill in the care of individual patients taken away? A system which results in poorer medical education and poorer, less faithful and less able application of professional skill on the part of the average doctor means, of necessity, poorer care for the average citizen. On the other hand a system which means better opportunities for adequate study and treatment of all patients and an assurance of adequate compensation as well as generally improved opportunities for training should result in an improvement in the care of the patient and in the economic position of the average doctor. Such a system would tend to discourage those medical and surgical brigands who—though often well-trained and capable and in "excellent standing"—nevertheless, by the use of a suave personality and with an eye always on the pocketbook of the patient, crowd their days full of a maximum amount of work that is superficial and inferior in quality and thus exploit their patients to the limit and amass an amount of wealth to which their professional attainments by no means entitle them. Granting that such men are pigmies in comparison to their prototypes in the business world nevertheless they have no place in the profession of medicine. A system such as we are discussing would tend to reduce the incomes of these individuals and proponents of the idea infer, perhaps correctly, that these are the very people who shout the loudest of favor of the maintenance of the status quo.

One must admit, however, that freedom of action in a democratic society must involve a certain amount of freedom to do bad work as well as good, and to take advantage of one's fellow citizens. Certainly the occasional necessity of living with and under the dominance of corrupt political organizations is part of what we pay for being citizens of a free country and the saving factor in the situation is that the power to control and overthrow such influences still resides in ourselves. A centralized federal control of medical practice such as was proposed in the original bill introduced by Senator Wagner and his colleagues and continued in the present revision of the bill would doubtless make it less easy for those of our profession who tend to take unfair advantage of their patients, but to achieve such an end at the cost of establishing a control of the medical profession that suggests a strong tendency to totalitarianism would seem a dangerous expedient.

It is evident from what has been said that the matters under discussion are very complicated and to none of the questions involved is there but one side. Let us attempt then to return to the fundamental issue that we have stated, and consider whether or not we, as physicians, believe that prepaid compulsory health insurance will be of benefit to the average American citizen.

It must be realized in discussing this question that not only the provision of enough medical services to those in need of them is involved but also the quality of the service provided. Anything that decreases the quality of service rendered, dependent as it is on the training and equipment of physicians as well as on the earnestness and zeal with which they do their work, decreases the benefit to the individual patient. A system, then, which is damaging to the work of the profession generally is, ipso facto, damaging to the recipient of medical care and what is good for the average citizen and what is good for the doctor must be to a great extent identical.

Compulsory "Health Insurance"

Let us summarize the main arguments on opposite sides of the question:

In Favor of a System of Compulsory Health Insurance

Inherently there is nothing at variance with established practices in this country in a system of

compulsory insurance. Such a system already operates in Workmen's Compensation legislation as well as the Rhode Island Cash Sickness Act. To make people pay for the safeguarding of their health is no different from the present system of compulsory payments for the education of their children and there is no fundamental difference between raising the money by taxation and raising it by compulsory prepaid insurance.

The need for better medical services to a fairly large proportion of the population, more in some parts of the nation than in others, is admitted. The only reasonable plan for furnishing such services appears to be a distribution of the costs by prepayment on insurance principles or else by direct taxation.

An insurance plan would provide funds to cover the costs of medical service, which now, though needed, is not being provided. It would also provide additional equipment and hospitalization facilities, better medical training for practitioners, better cooperation between practitioners and specialists and increased support for research.

A system can be devised which will be free from centralized bureaucratic domination, which will preserve freedom of choice between physician and patient and will continue normal incentives to self improvement and study on the part of individual practitioners. It can be made to incorporate, preserve and develop such voluntary agencies as have proved themselves adequate as, for example, the Blue Cross.

With the increasing complexity and cost of medical care a new system must be established and enough information is now available to indicate that anything short of a comprehensive nation wide plan with federal direction and support will fail in achieving its objective.

If properly planned it will not be in a real sense socialized or state medicine.

Against a System of Compulsory Health Insurance

Compulsory health legislation cannot be set up without such a complicated system of bureaucratic controls that it would interfere with the practice of medicine. It would prevent a real freedom of choice of physicians by patients and thus preclude the ideal voluntary relationship between the sick person and his physician which is a potent factor in the success of treatment.

By limiting the scope of a doctor's work and specifying the patients whom he may treat such a system would take away from him the incentive to good work which is inherent in the fact that he must at all times "make good" in the eyes of his patient.

It would not only decrease the doctor's urge to succeed in the individual problems presented to him by his patient's difficulties but it would also dull his ambition to study, carry on investigation and improve his professional skill.

In many European countries similar systems have been in use for years and, as attested by various studies of these systems (notably that made a few years ago by a representative of the Wisconsin Medical Society) the results, judged especially in terms of the work of the individual practitioners, have not been good and are not to be compared with the work of the average doctor in this country.

Whatever causes deterioration in the quality of medical service is damaging to the welfare of the average citizen and we cannot afford to risk a deterioration in the quality, in order to achieve an increase in distribution, of medical care.

Any system of bureaucratic federal control over such a large part of the life of citizens as would be inherent in the system needed to establish compulsory health insurance on a nation wide scale is definitely an example of overcentralization of control and a step towards totalitarianism.

* * *

The above summary is an attempt at an unbiased statement of opposing views on a fundamental question which, sooner or later, must be answered. Whether or not the Wagner-Murray-Dingell Bill is in any degree an adequate answer to the existing need or is open to most of the objections of those who are opposed to compulsory health insurance will have to be judged by a study of the facts regarding the bill as summarized in current literature. Incidentally it may be noted that if this bill be adopted, its provisions for *voluntary* cooperation on the part of practitioners are such that in any state or community, Rhode Island for example, a decision on the part of the majority of the physicians that they do not care to cooperate would, it appears, immediately make it, in that locality at least, null and void.

No attempt at present will be made to draw final conclusions except to repeat the opinions stated at the beginning, that with the increased complexity and cost of medical care, and the increased necessity for hospital facilities and for cooperation between physicians, some change from the status quo is inevitable. Final conclusions will, however, have eventually to be drawn. Let us, then, by a careful and unbiased study of the facts and not by that method of blind following of leaders that is so characteristic of sheep and human beings alike, make up our minds as to the fundamental issues that are at stake so that we may pass intelligent

continued on next page

judgment on every measure that is proposed in the attempt to do what we ourselves more than any other group of citizens are most anxious to accomplish, to improve the health and enhance the welfare of our fellow citizens.

ALEX M. BURGESS, M.D.
Chairman, Committee on Medical Economics

INTERNAL DERANGEMENTS OF THE KNEE-JOINT

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membrane may be visualized by careful routine inspection of the soft tissue outlines. These cysts may arise from any bursae, but they are generally encountered in the postero-lateral aspect of the knee. With extension and flexion of the knee, these cysts may change in size and shape, being directly connected with the synovial space. Lateral examination of the knee in flexion and extension may confirm these clinical findings, an important consideration in the surgical treatment of these cases.

Cysts of the Menisci

Cysts of the menisci, particularly of the external meniscus, is a well recognized condition. They are hemi-spherical masses attached to the periphery of the meniscus and they are comprised of a series of well defined spaces filled with a thick transparent mucoid material. This is taken to represent degenerative cysts comparable to ganglia, arising in the synovial and extra-synovial fatty and areolar tissue as well as in the fibro-cartilage. The external meniscus seems to be involved usually because it is the only cartilage that normally receives a partial covering of synovial membrance where it is crossed by the popliteus tendon; and it is at this crossing where these cysts often are found. The local swelling and pain caused by these cysts can be detected clinically, but careful study of the soft tissue shadows by the roentgenologist leads to a more accurate diagnosis. The demonstration of the meniscus in these cases rules out the presence of a torn or displaced meniscus, and this is not done with ease clinically.

Neoplasms

The malignant nature of bone tumors can be determined not only by searching the cortex and periosteum for evidence of a break-through into the adjacent soft tissues, but also by assiduous inspection of the soft outlines for signs of invasion. Tumors arising in the soft structure, like xanthomata, angiomata and fibro-lipomata are easily overlooked unless routine scrutiny of the soft tissues is a confirmed procedure.

Miscellaneous Soft-Tissue Conditions

Varicosities of the popliteal and long saphenous veins and of some of their branches can be seen in x-ray films without difficulty. Contusions with extra-capsular edema or hemorrhage can be distinguished from intra-capsular swellings and confirmed by the demonstration of the meniscus. Conversely, traumatic synovitis can be separated from contusion or other extra-capsular swellings, often only by the findings of the vacuum technique examination of the meniscus. This differentiation between intra and extra-capsular causes of knee swellings by the roentgen examination can be a source of much satisfaction to both the clinician and roentgenologist.

Summary

1. The necessity of a careful history and physical examination is stressed if the utmost diagnostic help from the x-ray studies is to be obtained.
2. The value of soft tissue and meniscus studies with the vacuum technique is reviewed in the x-ray examination of derangements of the knee-joint.

SURGERY OF THE VEINS OF THE LEG

continued from page 569

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MEDICAL SOCIETY AND HOSPITAL RELATIONSHIPS

TODAY perhaps more than ever before physicians and hospital administrators are faced with common problems.

There is the possibility of socialized medicine as typified to the nth degree by the Wagner-Murray-Dingell Bill. Much legislation at the State level is of common interest to the two groups. Workmen's compensation laws fall in this category. Many problems originating in the hospitals are of mutual interest and concern. One thinks of such things as rates, Blue Cross coverage, lack of beds, and lack of personnel in this connection.

At the present time, and so far as the writer knows of the past, there is no mechanism for common discussion of such problems. In New York State a joint committee representing the State Medical Society and the State Hospital Association has been formed, and so far has functioned with gratifying results. The following paragraphs quoted from an article in "HOSPITALS" give a thumbnail sketch of the history and goals of the committee.

"Today a wartorn world knows well the tragic consequences of the evil policy of divide and rule, which has brought civilization to the brink of destruction; yet through the years medicine and hospitals have unwittingly followed the precepts of this pernicious doctrine. Outside groups are even now invading the field of health, but instead of meeting them with articulate, constructive and coordinated action, medicine and hospitals have been inclined to drift passively along their own separate ways. Who amongst us will knowingly contribute to the continuation of such a divergent policy?

Proposal for Alliance

"Those were the thoughts in mind when a proposal was recently made to the state medical society by the state hospital association for a close alliance in all matters that involved both groups. From our membership have come expressions of approval and support for the plan, and statements from the ranks of medicine are similarly heartening. Letters have been received from the state medical society, from some of the county societies, from individual physicians and from groups outside the state. All are favorable and all promise support.

"A joint committee has been formed to achieve wider collaboration and closer coordination between the groups; to develop a joint policy for guidance in dealing with other agencies which directly or indirectly influence medical education, the practice of medicine or the care of the sick, and to recommend to the parent bodies appropriate joint action to be taken in regard to these or any other matters of mutual interest and concern to the doctors and hospitals of New York."

The writer raises this question, "Would not such a committee be of value in Rhode Island as well as in New York?" The proposal for such organization could originate with either the Medical Society or the Hospital Association. The thought is presented for possible consideration by both groups.

F. C. HOUGHTON, *Secretary,*
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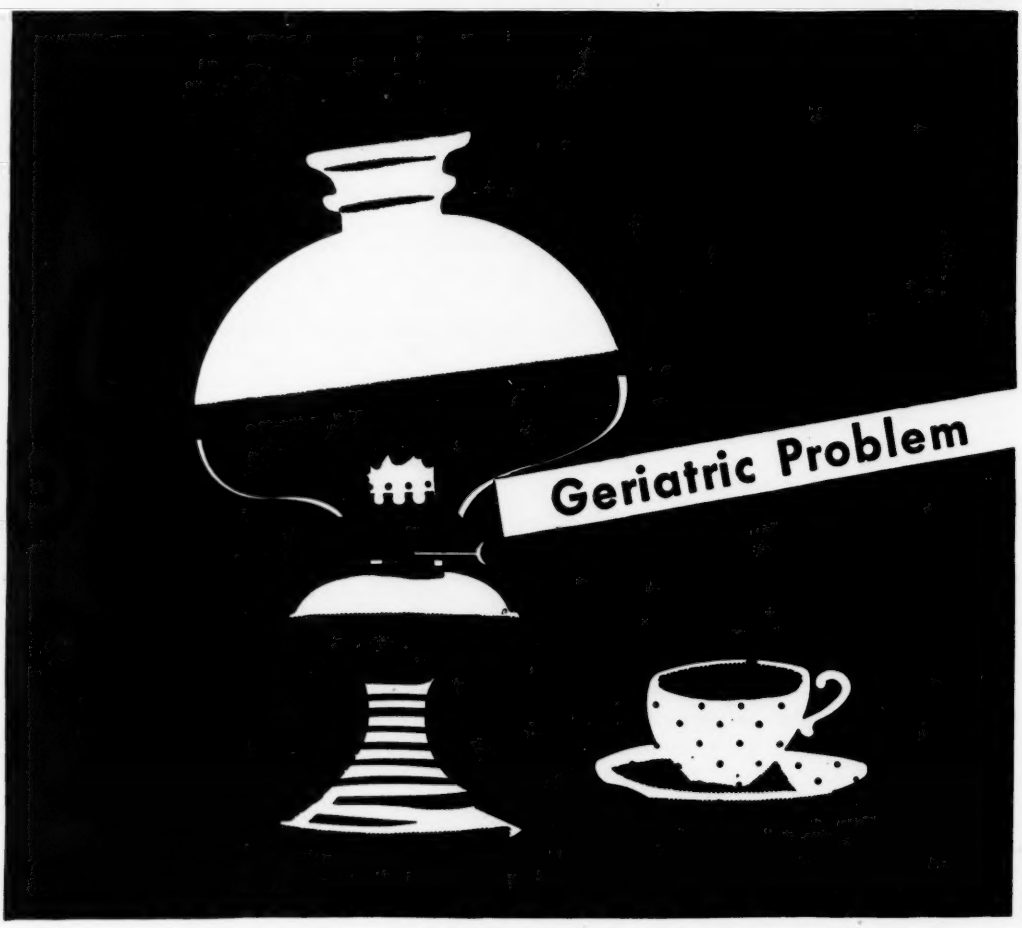

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INDEPENDENCE DAY — 1945

Public Statement from Dr. John F. Kenney to Governor McGrath

(At the Conference of Governors of the States held at Mackinac Island, Michigan, on July 3, 1945, Governor J. Howard McGrath of Rhode Island endorsed with but one reservation the Wagner-Murray-Dingell act now before Congress, and he urged the support of the measure by the other Governors. The following statement was issued by Dr. John F. Kenney, President of the Rhode Island Medical Society, late in the afternoon of July 3, and it was published in part in the *Providence Journal-Bulletin* on the morning of July 4, 1945.)

As President of the Rhode Island Medical Society which is vitally concerned with any legislation, local or national, affecting medical practice and the health care of the people of Rhode Island, I question the motives that have prompted Governor McGrath in his address yesterday at Mackinac Island to endorse enthusiastically and emphatically all the provisions, except one, of the Wagner-Murray-Dingell act recently introduced in Congress.

Governor McGrath, from the press reports I have read, made some all-inclusive statements regarding the merits of the Wagner act in advocating full support of it, as it is now written, by the Governors of the other states. Since the Rhode Island Medical Society has endeavored at all times to cooperate actively and willingly in any program for the better distribution of medical and hospital care for the people of Rhode Island, we are naturally concerned at the implications of Mr. McGrath's remarks.

I publicly question what he means when he states, as reported, that "security has become almost synonymous with 'life, liberty and the pursuit of happiness'," and "we, the Governors of the 48 states, . . . cannot wait until one social and economic 'foundling' after another is placed upon our doorstep, nor should we abdicate our responsibility to the people of our States in favor of the Federal Government."

What is Governor McGrath's definition of this security that he now advocates? He speaks of security in terms of safety without a struggle, of freedom from worry, whether from failure to budget expenditures, the inability to take risks in private enterprise or the unwillingness to sacrifice some of the amenities of leisure and pleasure for a program of constructive work. His concept of security appears to be the antithesis of security as people have always known it—security in the sense of savings, protective insurance of their own choice, a home of their own, education for their children, and a good job at good wages.

He calls for the adoption of legislation at the heart of which is federalization, and yet he talks of the measure as one in which "to a great extent State and local administration . . . *appears* to be preserved", and in which State and local participation "*seem* also to be fully recognized in the extensive program for the construction and administration of hospitals." And this "marvelous hospital program" calling for an expenditure of nine hundred million dollars in the next nine years is "*almost* wholly decentralized on the State and local level, with the exception of meeting certain Federal standards." *(italics mine)*

Doesn't he know whether the Wagner act as proposed will or will not protect the State's rights? Doesn't he know whether State and local participation in any hospital program sponsored with tax funds will definitely be recognized? Does he know what the Federal standards would be upon which the decentralization of any federal program would hinge?

As reported in the RHODE ISLAND MEDICAL JOURNAL in its editorial column last month, and as subsequently reprinted in part in the *Evening Bulletin* last night, the medical profession of Rhode Island is "clear in its purpose in that we seek improvement, but we must be sure that the improvement will actually be attainable, and that it will be permanent." The medical profession in this State has gone far in its effort to meet social problems confronting the people in regards to the distribution of medical and hospital care, and allied services. We were in the forefront in support of the Blue Cross which today has one of the largest enrollments of any comparable plan in the country. We proposed the idea of a State Advisory Council to bring together industry, labor, insurance, banking, the professions, and the public to discuss the best approach for a program to provide the extension of hospital and medical care. We subsequently consented to allow the Governor to name that Council, and the physician members worked enthusiastically, as he well knows, to achieve a sound answer to the problems raised. The findings of the Council have been made public, and they have called for greater support of the voluntary hospital-

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INDEPENDENCE DAY — 1945

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ization program. It was then within the province of the Governor to take as equally active leadership in sponsoring the voluntary way as he had in proposing compulsory methods upon his fellow citizens.

At the present time the Rhode Island Medical Society is engaged in a complete study of a plan for prepaid voluntary surgical insurance. A statewide committee of physicians and representative laymen is meeting regularly to prepare possible plans for adoption by the House of Delegates of the Society. Does Governor McGrath disregard these efforts now?

We were never consulted relative to the Cash Sickness Compensation act although the basis of the program centers upon the certification of disability. Medical opinions of illness or disability have been continually questioned as the State has sought to preserve the solvency of the fund, rather than the security of the individual which Governor McGrath now seeks. It is indeed rather inconsistent then to read of Governor McGrath advocating the Wagner Act which provides for advisory committes to consult regarding health insurance and allied problems, while at the present time our own Medical Advisory Committee to his appointed commission administering the State Cash Sickness Compensation program finds its suggestions and recommendations ignored.

The "marvelous hospital program" that the Governor advocates as being possible through the Wagner act is not the answer. The construction of facilities is not in itself any guarantee that any area will have sufficient medical care of a high quality. The shortage of physicians now owing to the withdrawal of doctors to serve with the armed forces will not end with the war. Selective Service decreed, in spite of the admonition of the medical profession, that no premedical students should be deferred from the draft. As a result, three years from now we will have far less doctors than we have today, for the overworked older doctors of America are dying at the rate of 4,000 a year. Facing such a situation, where does Governor McGrath foresee the personnel to staff the array of federally endowed hospitals that would be created through the Wagner act?

Situations such as this, as well as the idea that merely by a re-distribution of the money now paid for medical care in the United States everyone will get the highest type of care at any time he wishes it, and for no additional cost, are fallacies in the proposal that must be exposed. As the Social Security Board itself has stated, "Health among a people depends on many factors other than medical care—among them, the amount and distribution of national income, the level of education and of sanitary safeguards; and climate and other environmental factors."

The medical profession in Rhode Island is determined to advance the voluntary and free choice of action for the determining of individual security and protection, rather than yield to a program of public financial security under federal auspices.

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NEW ENGLAND MEDICINE ORGANIZES

CONTINUING to offer a progressive leadership in matters of organized medicine, the Rhode Island Medical Society, by action of its House of Delegates, initiated plans within the past month for the formation of a Council of the New England State Medical Societies. At the invitation of the Society representatives of five of the six state societies assembled in Providence on July 18 to discuss the proposal. A conflict in appointments on the day prevented Dr. Leighton, President of the Maine Medical Association from attending.

The following delegated representatives were in attendance when Dr. John F. Kenney, President of the Rhode Island Medical Society called the meeting to order:

New Hampshire Medical Society:
DR. ROBERT W. ROBINSON, of Laconia, President

Vermont State Medical Society:
DR. BENJAMIN F. COOK, of Rutland, Secretary, and MR. JOHN W. BROWNLEE, of Rutland, executive secretary

Massachusetts Medical Society:
DR. MICHAEL A. TIGHE, of Lowell, Secretary and DRS. DWIGHT O'HARA, of Boston, and ALLEN G. RICE of Springfield

Connecticut State Medical Society:
DR. JOSEPH H. HOWARD, of Bridgeport, President, and DR. JAMES R. MILLER of Hartford, Chairman of the Council

Rhode Island Medical Society:
DR. JOHN F. KENNEY, of Pawtucket, President; DR. HERMAN C. PITTS, of Providence, President-elect; DR. WILLIAM P. BUFFUM, of Providence, Secretary; and MR. JOHN E. FARRELL, executive secretary

The group drafted a code of operation whereby the Council would serve as a fact finding, deliberative body to serve the medical profession of New England. The present authority of each State Medical Society, as well as its relations with the American Medical Association, are in no manner to be disturbed by the new Council.

Setting forth its aims the proposed Council in its preamble states: "The main purpose of this Council is to bring about a closer co-operation between the State Medical Societies in New England in the development and maintenance of the highest standards in the conduct and administration of medical care, in the development of plans relative to the better organization of medicine, and in the furtherance of plans to improve the health of all the people in the New England states.

Inasmuch as all the composing members have problems peculiarly their own that cannot be solved by any general provision, this Council seeks to deal with those large matters in which all of the State Medical Societies are equally concerned. Further, this Council avows the principle that it shall not constrain its members to relinquish any existing affiliation, nor shall it seek to supersede the control now exercised by the governing bodies of each respective State Medical Society, nor by the House of Delegates of the American Medical Association."

Pending approval of the proposed Council as planned by the organizing group by each of the State Medical Societies in the area, temporary officers were elected to serve until April 17, 1946. The Council also voted to ask each of the six State Medical Societies to subscribe $100 to support the work of the new body during the first experimental year.

The temporary officers elected by the representatives to serve until next April were:

President: Dr. James R. Miller, of Hartford, Connecticut, who is Chairman of the Council of the Connecticut State Medical Society.

Vice President: Dr. John F. Kenney, of Pawtucket, Rhode Island, who is President of the Rhode Island Medical Society.

Executive Secretary and Treasurer: Mr. John E. Farrell, of Providence, Rhode Island, who is executive secretary of both the Rhode Island Medical Society and of the Providence Medical Association.

The next meeting of the new Council is planned for Sunday, October 14, at Providence.

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SURGEON GENERAL OUTLINES PERSONNEL RELEASE POLICY

Substantial releases of Army Medical Department personnel will not take place before the latter part of this year, Surgeon General Norman T. Kirk states in announcing a policy on discharges in conformity with War Department procedures. This is due to the fact that the peak of the Medical Department's activities will not be reached until fall.

In formulating the policy consideration was given to civilian needs for professional medical, dental and veterinary care without weakening military needs. Other factors considered were the length of time necessary for personnel to complete their work in the Mediterranean and European Theaters and return to the United States; replacement of Medical Department personnel in active theaters by those who have not had overseas duty; necessity for the maintenance of a high standard of medical care; the heavy load of patients in the United States; evacuation of the sick and wounded from Europe in the next ninety days and continuing medical service in the Pacific.

The policy applies with equal effect to Army medical officers assigned to the Veteran's Administration and other agencies.

It reads:

Medical Corps

a. Officers whose services are essential to military necessity will not be separated from the service.

b. Officers above 50 years of age whose specialist qualifications are not needed within the Army will receive a high preferential priority for release from active duty.

c. Adjusted Service Ratings will be utilized as a definite guide to determining those who are to be separated.

PSYCHIATRIC CLINIC FOR VETERANS

Servicemen are returning to civilian life from duty in the armed forces in increasing number, many of whom have a neuropsychiatric disability. We will be remiss in our duty if we do not provide for their care and treatment. The sub-committee on Physical and Mental Health, of the State Veterans' Retraining and Re-employment Committee is taking an active interest in the welfare of these discharged soldiers who are suffering from mental disabilities. It is common knowledge there are many of these men going about the state looking for medical assistance who are not aware of the facilities at hand for their specific benefit.

The Board of Hospital Commissioners of the Charles V. Chapin Hospital has made available to non-service connected disabled veterans a particular period of the visiting days of the regular neuropsychiatric clinics held on Monday and Friday mornings. We feel that special consideration should be given these veterans, who are entitled to all we can give them. To assist in this set-up and avoid confusion and unnecessary delay, the veteran is asked to bring with him from his Service Center, the Red Cross, hospital clinics, or other facilities, proof of his status as a veteran.

Assignments to these clinics are made by appointment and must be made through Miss Ruth F. Levy, chief neuropsychiatric social worker at the C. V. Chapin hospital. Call for appointment between 9 A.M. and 5 P.M. week-days.

TYPICAL WARD OF 48th EVACUATION HOSPITAL IN BURMA

Photo on left shows exterior view of ward at Myitkyina, Burma, of the 48th Evacuation Hospital (The Rhode Island Hospital Unit). Construction is of teakwood, bamboo, and tarpaulin with hessian cloth screening. The view on the right shows the interior with its packed earth floor. . . . *U. S. Signal Corps Photos*

It is now established that antirachitic protection must be given, not only in the first years of life, but maintained until the child has reached at least 14 years of age.

Follis, R. H. Jr., Jackson, D., Eliot, M. M. and Park, E. A., Prevalence of Rickets in Children Between Two and Fourteen Years of Age: Amer. J. Dis. Child., 66: (July) 1943.

In children beyond the period of infancy, because of objection to taste or routine, it frequently is difficult to maintain effective prophylaxis against rickets—and provide adequate treatment for this and other vitamin D deficiencies with the use of cod liver oil and other types of vitamin D in low potency units where daily dosage is necessary.

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PAYING FOR MEDICAL CARE UNDER THE RHODE ISLAND PUBLIC ASSISTANCE ACT

*(Report of the Experiment in the Method of Payment for Medical Care in the Towns of East Providence, Bristol and Warren)**

MARGARET D. WARD

The Author. *Miss Margaret D. Ward, of Providence. Acting Chief Supervisor, Division of Public Assistance, Rhode Island Department of Social Welfare.*

THE Rhode Island Division of Public Assistance within the State Department of Social Welfare has considered adequate medical care to be one of the essentials of life, which should be available to all persons, as for example are food, shelter and fuel. The inclusion of the cost of such medical care in assistance payments provides an opportunity for each individual to incur expenses and to meet his total obligations as he sees fit, as any other member of the community in a democracy does.

Since the passage of the Social Security Act in 1935, and particularly since the General Public Assistant Act, Article I., Chapter 1212 of the Public Laws of 1942, and the Public Assistance Act of 1944 were passed, the Division of Public Assistance has continually maintained as a major objective, the establishment of a standard of living for all persons in Rhode Island compatible with physical and mental well-being and which would take into consideration all of the requirements and all of the resources of persons in need. Provision for medical care was generally made through direct payment to the vendor by the agency from General Public Assistance funds.

Governor J. Howard McGrath in a speech to the Rhode Island Conference of Social Work, in September, 1943, said, "It is the broad and long-range objective of this state to insure, through its policies, that no man, woman or child in Rhode Island shall unnecessarily die, be crippled or handicapped merely because of the fact that he does not have funds to pay for adequate medical care. . . . Inherent in this objective is the determination that the state and its political sub-divisions shall not in the future be subject to the costs of providing assistance to dependent individuals whose dependency could have been prevented had they received adequate medical care. . . ."

On the basis of this statement, the Rhode Island Division of Public Assistance planned to undertake an experiment in the method of payment of medical care. A great deal of planning and thoughtful preparation was given to this experiment before one word of plan material was written. The Town of East Providence was chosen for the experiment because it represented a large enough unit of local government with which to work easily. It included some medical resources such as a district nursing association, a local health department, a school nurse, and a Red Cross Chapter; it was adjacent to the City of Providence where there were several general hospitals; its culture represented various nationalities—Portugese, Italian, French, Swedish, Irish-American; there was an integrated program of Public Assistance working efficiently; and the local director of public welfare, Mr. John F. Newman, was very much interested in strengthening Public Assistance Service and public welfare in its broadest sense. This director participated in the progress step by step prior to any staff discussions. Consultation and assistance were given to the Division of Public Assistance by a medical consultant in the Bureau of Public Assistance, Social Security Board. Preliminary meetings for discussion purposes and education were held with the staff and with the medical practitioners in the community, in order that they might understand as much as possible before the experiment went into effect the purpose of the experiment, how it might be developed effectively, and what it would mean in strengthening the patient-practitioner relationship. A booklet was printed in very simple English. This was sent to every recipient of Public Assistance, was given to each applicant, was sent to all medical practitioners in that community and adjacent communities and to the members of the Social Welfare committee of the Rhode Island Medical Society, who also participated in preliminary and subsequent planning.

On January 1, 1944, the Division of Public Assistance, within the State Department of Social Welfare, in cooperation with the Director of Public Welfare, Mr. John F. Newman, in the town of East Providence, was ready to begin this experiment which would determine whether or not medical care might well be included in the money payment for Old Age Assistance, Aid to Dependent

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PAYING FOR MEDICAL CARE UNDER PUBLIC ASSISTANCE ACT

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Children, Aid to the Blind, and General Public Assistance, just as any other requirement might be.

The intent of this plan was to foster the usual relationships between recipients of Public Assistance and medical practitioners in the community. The recipient was not to be deprived of any of his rights or responsibilities for self-direction. He was free to plan the use of his assistance payment as he saw fit and was responsible for selecting and paying for the goods and services which he required.

For the purpose of this experiment, assistance in cash was provided to include the costs of all types of care recognized by competent medical authorities as essential in the treatment of illness, injury, or physical defects, including preventative and curative services and those services directed toward the alleviation of suffering and the correction of defects. All such services were available for the period necessary for treatment or cure. The term "medical care" included physicians' services, that is general practitioners and specialists in the home or in the office, nursing services, services of dentists, drugs and medical supplies, glasses and optical supplies, surgical and prosthetic appliances, ambulance service, clinic care, hospital care in a public or private hospital, laboratory services of a diagnostic or therapeutic nature, obstetrical care, nursing home care, and any other service recognized by the American Medical Association or any supplies needed for the care and treatment of illness or injury.

Any recipient of Old Age Assistance, Aid to Dependent Children, Aid to the Blind, and General Public Assistance who, after adequate, prompt, and sound determination of eligibility was found to have income and resources which enabled him to meet the costs of all his requirements, except medical care, or any other person whose income and resources were not sufficient to meet the cost of medical care was eligible for assistance in accordance with the provisions set forth in the plan. The recipient of Public Assistance had free choice of all practitioners included in the scope of medical services if that practitioner met the standards.

All payments made to persons were unconditional money payments in order to enable the recipient to meet his obligations and discharge his responsibilities as he saw fit. Medical need was determined on the advice of competent medical authority. Emergency care was always considered to be a requirement, but the decision to supply funds to meet the cost of care beyond the first visit was dependent upon the recommendation of the attending physician. Costs for all services were considered in general on a fee-for-service basis. When recurrent medical expenses could be predicted, they were included in the assistance payment on a cash-in-advance basis. A schedule of fees was established for each service provided within the scope of the plan and represented the amounts which the Division of Public Assistance would consider as cost standards in making the assistance plan. The recipient was ordinarily expected to continue under the care of the medical authority initiating the care for the duration of the illness unless released or discharged or for some valid reason.

The experiment was carried on in accordance with all the regulations set forth in the Standards of Assistance of the Manual of the Rhode Island Division of Public Assistance, and these provisions for payment for medical care were supplementary to any income or to any assistance available from relatives or other sources in order to conserve funds and to make maximum effective use of all existing resources. In order to be sure that this experiment would be carried out in accordance with the basic philosophy of the Division of Public Assistance, and in order that medical care would not be set up as a special requirement but as one item in the total requirements necessary for any individual to insure health and well-being, it was important for the social work staff to know and to be fully cognizant of the fact that illness may affect or be affected by the other requirements, and for

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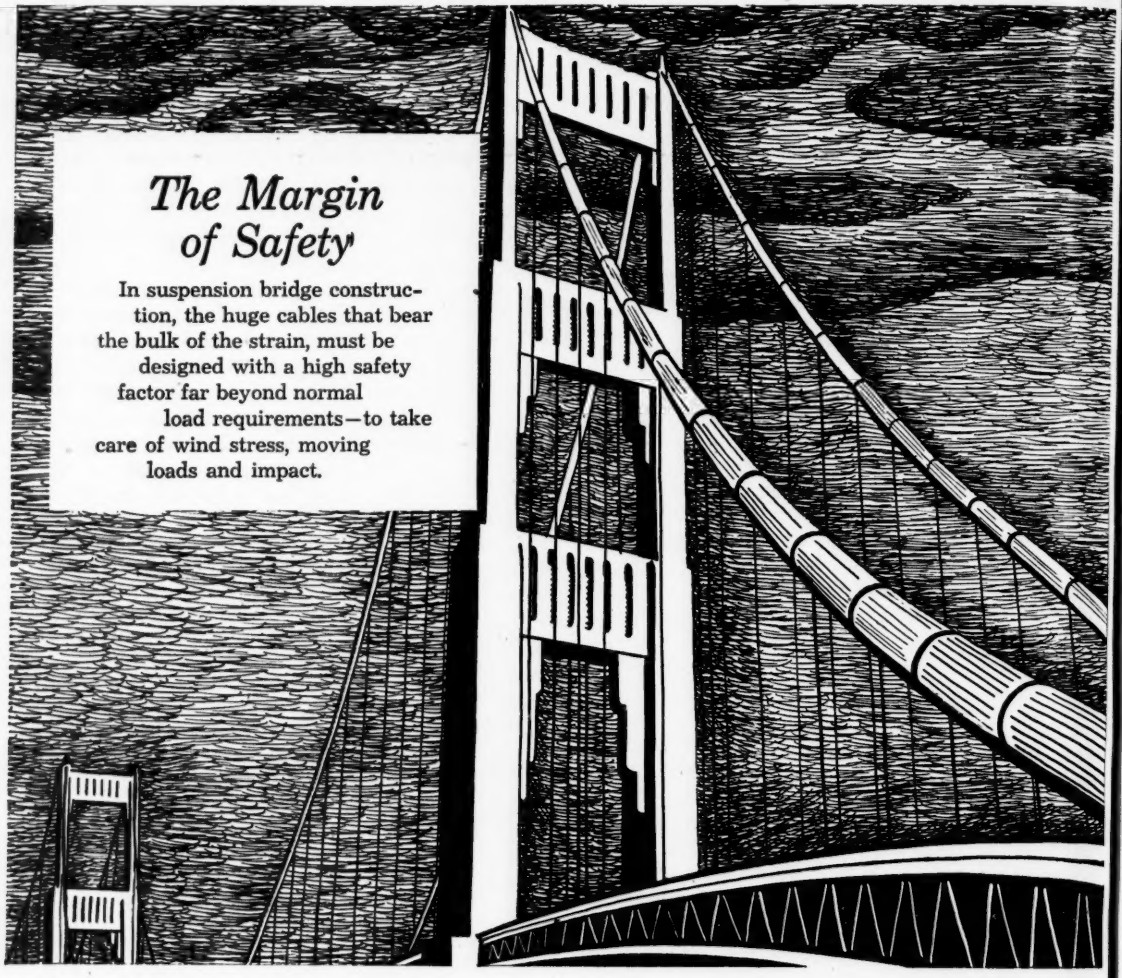
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this reason any application for payment would necessitate a reconsideration of the recipient's total situation in determining his need and the amount of the assistance payment. Just as with other needs, the recipient is considered the primary source of information and should be responsible for initiating his plans for securing necessary care, for obtaining evidence of his need for medical care, and for completing the payment of his bills. This did not preclude on the part of the staff any assistance in helping the recipient to make his plans. When service was necessary, it was given and was provided on the same basis as service provided in connection with any other requirement. Careful supervision was necessary in order to develop the case work process and to help the staff to understand that in all contacts, all information should be secured purposefully. Contacts with medical authorities were to be made on a planned basis and not just for the purpose of securing a diagnosis. This was ordinarily done in writing and the medical practitioner was given a great deal of interpretation in regard to the reason for the request and the use to which it would be put after the information was secured. The emphasis for the staff was in terms of securing information which would help the worker to understand what illness means to any recipient in terms of total family planning rather than what a diagnosis, as an isolated fact, means.

On January 1, 1944, when the experiment started, persons in the community of East Providence were well aware of what was happening and knew that, except in very unusual situations, where the recipient was absolutely too handicapped to handle his own funds, money payments would be made, regardless of the federally reimbursable maxima, to all recipients to cover their total requirements.

The community knew that the Division of Public Assistance would not interfere with the relationship between the recipient and the medical practitioner of that recipient's choice. It was hoped in the beginning that in trying to evaluate the effectiveness of this plan, it might be possible to determine what the effect of the experiment would be on the (1) recipients of Public Assistance (2) whether or not the recipients would prefer this kind of payment to the direct payment to vendor plan (3) how the costs in the Division of Public Assistance under this plan would compare with those up to the time of its initiation (4) the proportion of persons receiving medical care only (5) the volume of the different types of expenditures involved (6) whether or not any more prompt service could be provided to recipients (7) whether or

continued on page 607

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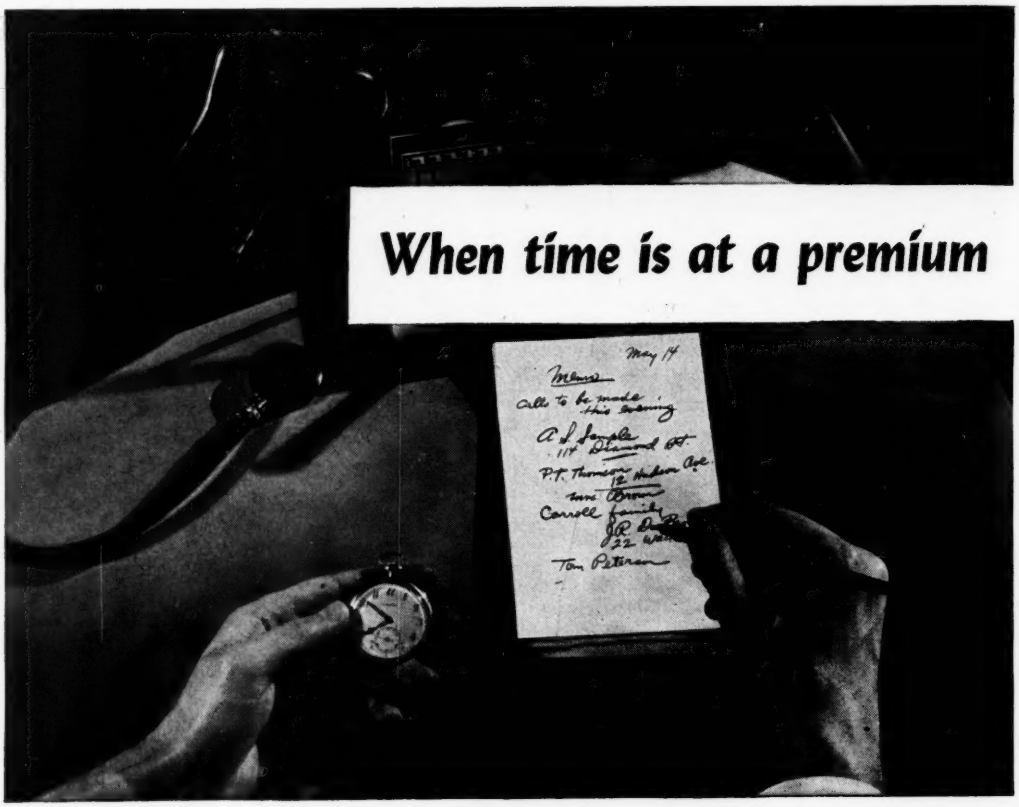

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PAYING FOR MEDICAL CARE UNDER PUBLIC ASSISTANCE ACT

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not the vendors would be satisfied with this method of payment (8) the kinds of situations needing the special approval of the medical consultant within the Division of Public Assistance and which, therefore, might necessitate a change in policy (9) the proportion of applications received which were denied in order to determine what kinds of services, if any, were not covered by this plan and (10) the reactions of the medical practitioners and all vendors to this method of payment for medical care. All these things were taken into consideration and the necessary statistical reporting sheets were established in order to insure an evaluation of this material.

It was found that there were many mechanical procedures which could be easily simplified and these were of great benefit to the total program of Public Assistance in eliminating unnecessary red-tape. Before the six months' period in East Providence was completed, the recipients who had participated were asked to give their reactions.

Eighty-six recipients stated their reactions:

- 9 objected to the plan and would have preferred to have the agency assume all their responsibilities for them.
- 7 had an attitude of objection, but did not make any definite statements to that effect.
- 7 were definitely pleased with the plan, felt more independent and capable of assuming all their responsibilities.
- 29 indicated in their attitudes that they were pleased with it.
- 29 had no reaction to it—they did not care one way or another.
- 5 stated that it was inconvenient.

The experiment in medical care had so great a significance on the entire program of Public Assistance in the town where it was instituted that it was decided to continue the experiment in East Providence simultaneously with similar experiments begun in the towns of Warren and Bristol where the same kind of interpretation, the same kind of community education and the same kinds of booklets were distributed.

The experiment in those two towns began on September 1, 1944 and continued until March 1, 1945. During this whole period, meetings were held by the administration and consultant staff with the local director in Bristol, Mr. Joseph J. Marshall, and Mr. Charles F. Pratte in Warren; with the committee of the Rhode Island Medical Society and with the Welfare Committee of the Rhode Island Dental Society.

On March 1, 1945 when this experiment had continued in the town of East Providence since January 1, 1944 and in the towns of Bristol and Warren since September 1, 1944, a complete evaluation of the program was made and certain conclusions were drawn.

1) Quality of the care received could not be measured as it is impossible to measure quality of any such care. However, it is significant that not one complaint had come to the state office from any recipient or because any care had been denied to a potential recipient.

2) The Directors of public welfare in the three towns were of the opinion that ordinarily this method of payment was very satisfactory. In unusual situations, because of individual problems, the direct payment to vendor was more satisfactory in meeting medical care requirements just as it was more satisfactory in meeting total requirements for such persons.

3) The medical and dental advisory groups had participated in the plan, had offered no specific objections to it, had recommended changes in certain medical and dental cost standards, and were indicating a willingness to participate in overall planning should the Division of Public Assistance decide to extend the experiment on a state-wide basis.

continued on next page

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PAYING FOR MEDICAL CARE UNDER PUBLIC ASSISTANCE ACT

concluded from preceding page

4) Although all medical practitioners had been asked to criticize or comment on this method of payment, no unfavorable criticism has been received. One practitioner stated that recipients of Public Assistance paid their bills better than the general public did. One other practitioner stated that this was a good way "to eliminate socialized medicine and build up the relationship between the patient and practitioner." Another practitioner said it seemed almost too good to be true. All physicians in East Providence, Bristol, and Warren, as well as some physicians in adjacent communities, were participating in the program.

5) More than 50% of the recipients of public assistance in those towns had made their medical care needs known and were enabled to obtain medical care under the provisions of this plan.

6) Recipients of public assistance are as capable as any other members of the community, for initiating their own plans, meeting their own obligations and paying for their own bills when they have sufficient money to do so.

7) Of those who received medical care under this plan, 58% were persons 65 years of age or over. Therefore, many of those who received care could not go into employment but were able to assume greater responsibility in their homes. This lessened the strain for others in the household, made it possible for the recipients to live more fully in that their health was generally improved and there was a resumption of such activities as reading and sewing when glasses were purchased or new lenses were obtained.

8) The average payments in all assistance groups were equal to or less than the State average with the exception, of General Public Assistance payments in one town.

9) There was no increase in the cost to the State on an overall basis because payments made in this manner are matched by the federal government up to certain maxima. Payments made directly to practitioners under the old plan were not matched as they were made directly from State and local funds.

10) Less than 6% of persons applying for this kind of care have been denied the care and in several instances the persons themselves withdrew their applications when they found they were not eligible. This indicated that, although widespread "advertising" had been given to the plan, it was used actually only by those who met the provisions.

11) In only three situations to our knowledge have persons failed to pay their bills.

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PAYING FOR MEDICAL CARE UNDER PUBLIC ASSISTANCE ACT

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12) The social work staff is becoming increasingly more aware of the total needs of the family groups and the total lack of resources in the community.

13) The staff had developed in their application of case work techniques and had become aware of the administrative aspects of case work.

14) Costs standards for all kinds of medical care with the exception of physicians' fees in one town were realistic and in accordance with the prevailing rates. Standards which were not realistic were discussed with the Medical Advisory Group. The booklets were a source of public education and assisted in extending more constructive public assistance service to the community.

15) No blind persons had requested any kind of care.

16) The Division of Public Assistance made it possible to change payments semi-monthly, thus effecting more prompt increases and decreases to enable recipients to meet the payment of bills. Under the direct payment plan, vendors submitted bills on the 10th of the month following the provision for care, and payments were made at a later date by the agency. Under this plan, the recipient might pay the practitioner when he received the care and the agency, upon presentation of the evidence by the recipient, would make provisions for including this in his assistance payment.

17) There has been a slight increase in case loads in all groups of assistance in the last year on a state-wide basis. In East Providence where figures are available for the first three months of 1944 and the first three months of 1945 the requests for medical services have not increased. In January, 1944 the requests for all medical services were 18; in February, 1944, 33; in March, 1944, 39; in January, 1945, the request for all services was 26; in February, 1945, 27; and in March, 1945, 40. There has been no marked increase in requests.

18) The most expensive item for medical care is hospitalization.

19) The medical services requested most frequently are

a) physicians' services in the office
b) drugs and medical supplies
c) dental care
1) 20% of all requests in the Old Age Assistance group were for some form of dental care.

continued on page 613

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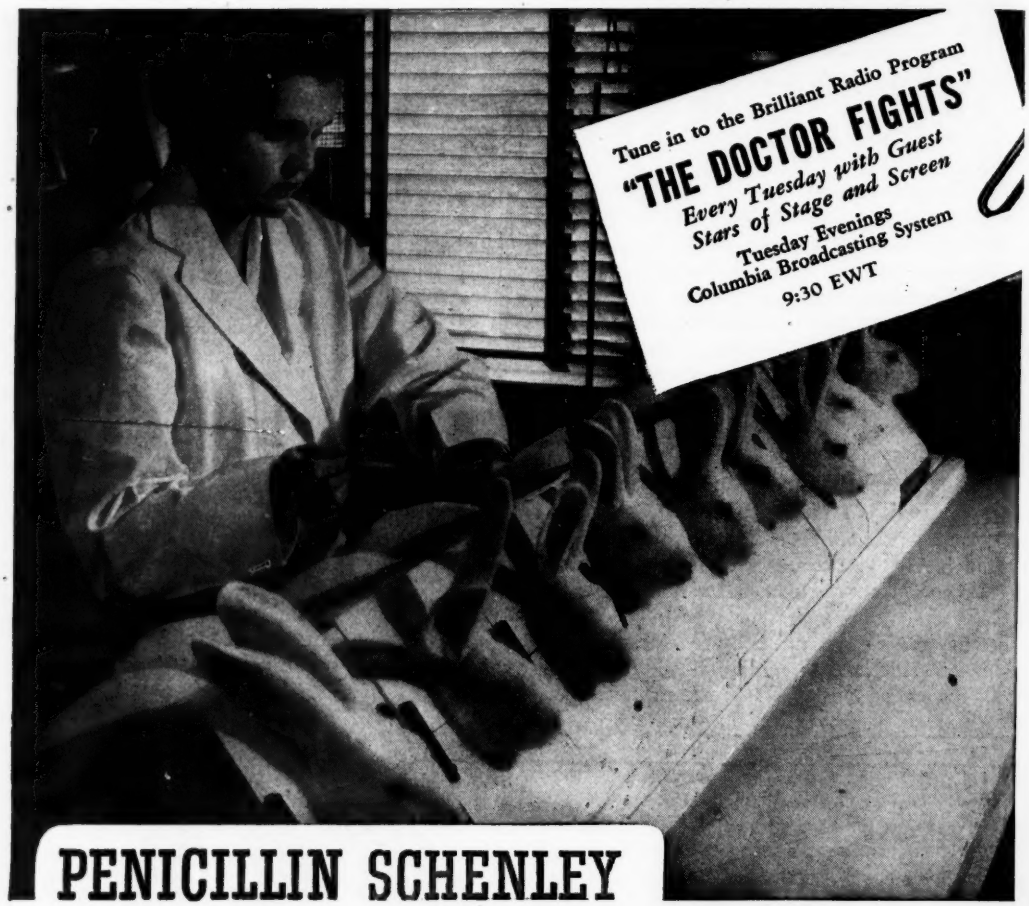

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PAYING FOR MEDICAL CARE UNDER PUBLIC ASSISTANCE ACT

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2) 33 1/3% of all requests in Aid to Dependent Children group were for some form of dental care.

3) 13% of all requests in the General Public Assistance group were for some form of dental care.

Until this plan had been put into effect very little dental care had been provided.

20) The dearth of opthalmologists in the localities made it necessary, upon the recommendation of the State consulting opthalmologist and the Medical Advisory Group, to change the quality standard somewhat in regard to examination for glasses and obtaining optical supplies.

This experiment in addition to the above has been very beneficial to the Division of Public Assistance as a project in staff development. It has made the workers aware of the meaning of illness in terms of the family group. It has meant a better understanding of the use of all resources and has helped the Division to meet its objectives of sound determination of eligibility; recognition of the dignity of man, the rights of the individual, and his ability to direct his own life in the community even though he may be in need of financial assistance; interpretation of Public Assistance service to the community; and the establishment of adequate, realistic standards of assistance which are essential for maintenance of health and well-being, in all aspects of the integrated assistance program.

The results of this experiment justify at this time, bringing the experimental period to a close, and making plans for the extension of this method of payment for medical care, as a part of the entire Standards of Assistance of the Division of Public Assistance on a state-wide basis.

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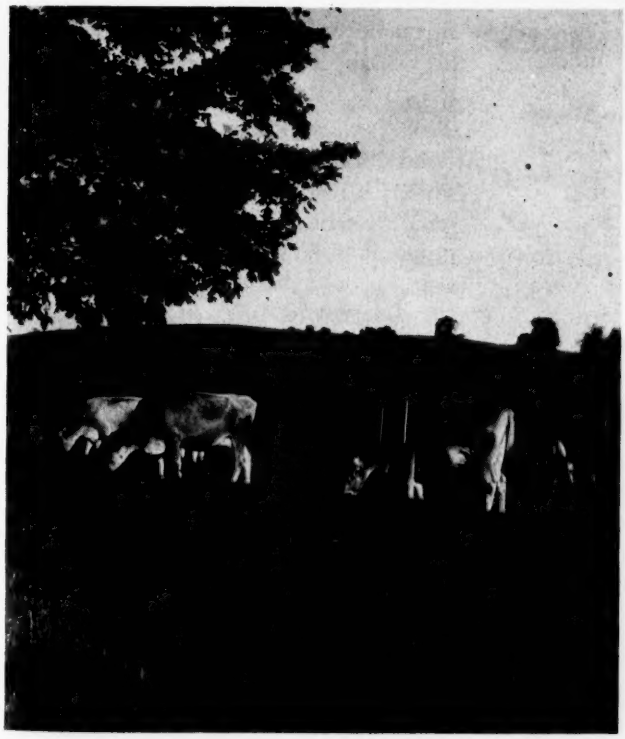

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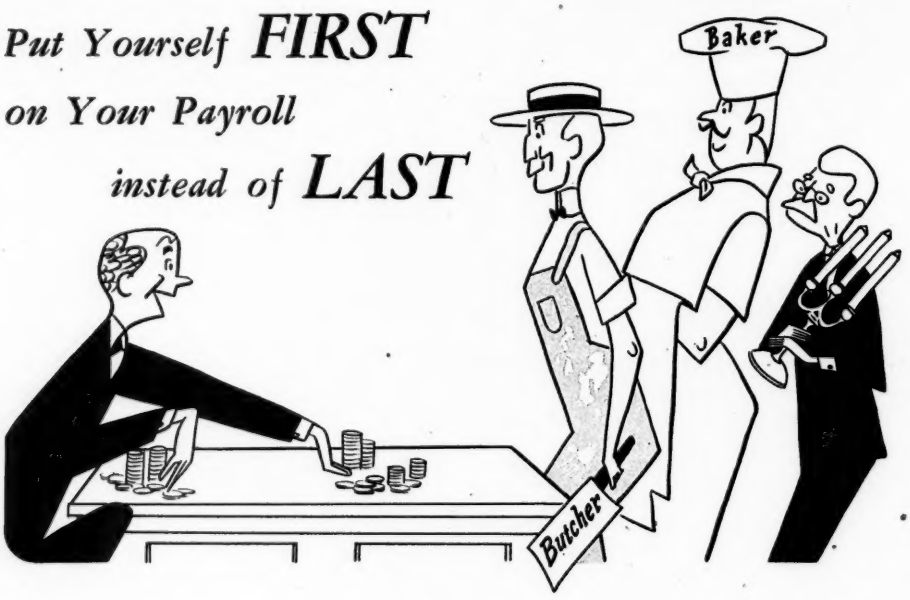

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A DISCUSSION OF THE CAUSES OF CANCER

continued from page 578

trying to determine which human beings have hereditary susceptibility has no answer at present but this is true for all sorts of other skeletons in the human closet, except in a few instances on a probability basis.

3. For completeness, the third division of genetics in cancer concerns transplantation. It is possible to breed mice so that they will become more susceptible or less susceptible to transplantation of a particular tumor from within the same species. But if a strain "takes" a particular tumor it does not necessarily "take" others. The larger problem in this field is the transplantation of tissues in general. The fact that skin, let us say, from A cannot be transplanted to Patient B prevents the establishment of "skin banks" analogous to the successful establishment of blood banks.

A constitutional or genetic susceptibility is also displayed to carcinogens by various strains.

CARCINOGENS: The carcinogen story usually begins with chimney sweeps' cancer and soot as recorded by Percival Potts in 1775. Many attemps to reproduce cancer in animals with soots and tars led finally to its experimental production in 1915 by Yamigiwa and Itchikawa. Woglom's publication of 1926 gives 290 references; some 400 were added from 1926 to 1932 and several hundred more from 1932 to the present. The following generalizations are applicable at present. Carcinogens produce malignancy readily in certain animals, such as rabbits, mice and rats. Others, such as guinea pigs, are relatively refractory. That the production of cancer is not entirely local is shown by the fact that strains of mice may be so inbred that they become more susceptible indicating that a general genetic factor is involved. Neither age nor sex is important. The time factor is the same for young or old animals. Some carcinogens are more potent than others. Carcinogens start malignancy but are not necessary for its continuance. Many need not be applied more than a few times when months later malignancy appears in the area treated. This is analogous to the latent period in development of aniline bladder cancer in human beings. The transformation from distortion to actual malignancy is sudden. This latter statement will be debated. It is interesting that in the animals which are refractory to carcinogens, e. g., guinea pigs, the application of carcinogenic compounds such as potent tars produce all the changes which we are accustomed to think of as precancerous but the animals do not develop cancer. Therein is a lesson in the diagnosis of "precancerous" in human beings. Such a diagnosis implies a prophecy and scientifically we should be cautious. Practically we may say to a group of one hundred human beings with, e. g., hyperkeratoses, "Some of you will develop cancer in those blemishes. I cannot tell which but if all of you have all the lesions removed none of you will develop cancer in them."

Almost three hundred compounds are listed as active carcinogens. Most of them produce their results by direct contact on the skin, under the skin, or in other situations; but certain ones, such as ortho-amido-azo-toluol pick out specific organs, i. e., the liver, when fed by mouth, but are under dietary control since at least biotin favors and riboflavin antagonizes the carcinogenic activity of these compounds. No generalizations are possible at present as to chemical structure. They do not all contain carbon, for arsenic and zinc chloride are known to produce cancer; and so do the physical agents X-rays and ultra violet radiation.

Are any of the carcinogens naturally-occurring? If so, then a natural "cause" of cancer has been discovered. Among them are the cholesterol series. Another is methyl cholanthrene. On paper the relation of numerous degradation products can be constructed but that the necessary chemical reactions actually occur in the human body remains to be demonstrated.

continued on next page

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A DISCUSSION OF THE CAUSES OF CANCER

continued from preceding page

It is obvious that any and all of the carcinogens, to satisfy biological requirements, must somehow change the internal mechanism of cells so that a new race is produced which transmits its altered characteristics. Of what these intracellular chemical and physical changes are, not one bit of settled knowledge is at hand. As a matter of fact we know too little of normal intracellular dynamics for any comparison of any kind to be made.

VIRUSES: Viruses are known to produce (1) chicken sarcomas, (2) papillomas in wild rabbits and cancers in tame rabbits, (3) frog cancers, and (4) possible mammary tumors in mice since there are indications that the "milk agent" has the properties of a virus. Are some human tumors virus caused? Perhaps certain warts or condylomas are; for instance, those on the fingers, popularly supposed to be due to handling toads. Some plantar warts are known to occur in epidemics spread from gymnasium floors, shower baths, etc. Further data concerning viruses are interesting and suggestive, but again we must hurry on.

CHEMISTRY: I might go into considerable detail about chemistry and cancer. Beyond calling your attention to the facts that there is a chemistry of the body of cancer-bearing animals and human beings, a chemistry of tumor cells themselves, a dynamic chemistry and physics of normal and cancer cells in which the key subject is intracellular metabolism and various other chemical considerations, I merely call your attention to a publication in which this aspect is well treated. If we agree that control of natural phenomena is obtained not by descriptive knowledge of statics but by knowledge of the more general chemical and physical facts it will be agreed that the more we know of the chemistry and physics of malignancy the more likely we are to obtain control.

I find in my notes a dozen or more topics, all of which I must necessarily omit since after all I am not trying to write a text book or a number of volumes on cancer. Perhaps a word or two about treatment will be of interest. For the cancer itself there are surgery or irradiation and/or both. Just when the limit seems to have been reached, fresh advances are made. From many fields comes applied knowledge such as better control of infection, blood and plasma transfusions, the physico-chemical equilibrium of the body fluids so that present day surgery of the lung, the stomach, the rectum is far superior to that of just a few years ago. The development of reconstructive surgery makes possible the removal of far larger areas. A few aphorisms describe the situation in part such as "Faint heart ne'er cured cancer patient"; "One surgeon to remove the cancer and its surroundings, another to close the wound"; "No matter how distressing the surgical defect after skillful removal, the cancer will produce a worse defect if not totally removed or destroyed."

We now have a million and even a million and a half volt X-ray machines for deeper penetration and safer skin exposures. It is true that radioactive elements, e. g., phosphorus, have been disappointing in the treatment of cancer, specifically leukemia, but only a beginning has been made. Even so with all the improvements, the gross death rate rises. Sixty per cent of the cancer patients reported to the Division of Cancer Control were dead within one year of definitive treatment. Until better understanding of the fundamentals is reached, and probably even then, the key note is earlier and earlier diagnosis.

Finally I again express appreciation for the opportunity to deliver this rambling story. It is, as you have heard, incomplete in every respect but there is one thing that you may have noticed, viz., a change from the usual pessimism of discourses on cancer of twenty-five or more years ago to healthy optimism, at least from the experimental side. Today, not only are there many main paths of investigation clearly outlined (but numerous side lines as well—indeed, some of the main paths are in the form of quite well defined leads. Meanwhile an increasing number of patients with cancer can be placed in a position to be completely relieved of their tumors by wider education and improving technics of diagnosis and removal.

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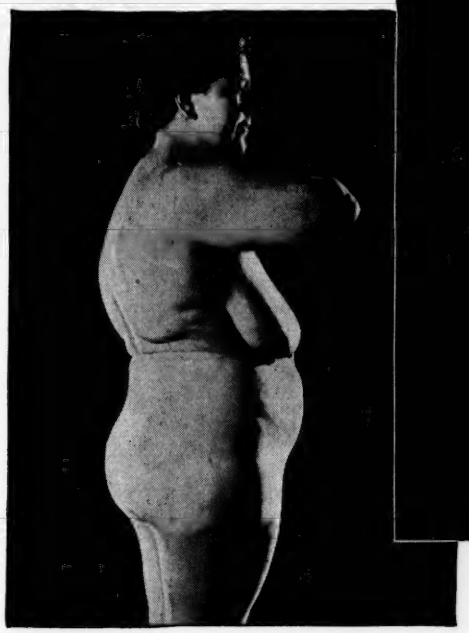
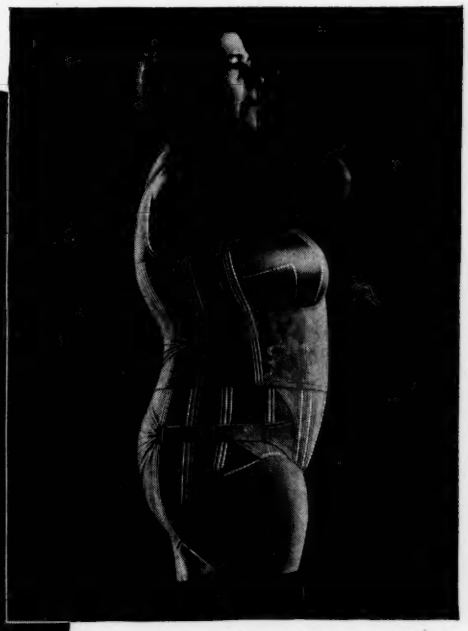
Patient (below) of stocky type-of-build, showing degree of excess fat frequently seen by physicians.





Same patient (above) after application of Camp abdominal and breast support. Note that the adjustment encircles the major portion of the pelvic girdle.

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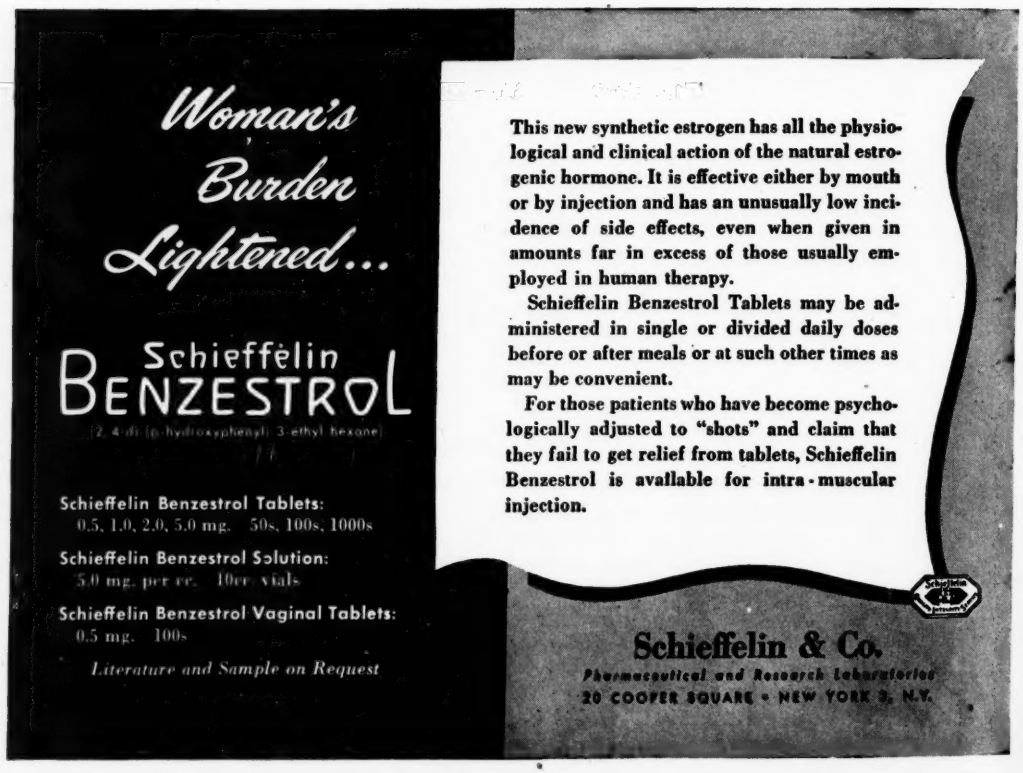
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